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ORIGINAL ARTICLES.

A CASE APPARENTLY OF TYPHOID FEVER ASSOCIATED WITH TUBERCULOSIS AND NEPHRITIS.*

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The following case seems to me of sufficient interest to deserve a permanent record. Briefly, the history is this: A man who had a continued fever of high range and most of the ordinary symptoms of typhoid fever, whose blood responded positively on two occasions to the Widal serum-test, had also tuberculosis and nephritis, which were recognized during life. The man died about six or seven weeks after his convalescence from typhoid fever, of which the autopsy showed scarcely any evidence.

J. J. P., 40 years old, was admitted to the Philadelphia Hospital July 17, 1897, complaining of fever, of looseness of the bowels, and of feeling all "broken up." His father and mother were both dead of causes unknown to him. The patient had had measles, mumps, chicken-pox, pertussis, diphtheria, subacute rheumatism, and small-pox. He denied having had chancre or chancroids, but confessed to at least three attacks of gonorrhea. He had been a heavy drinker and had used a great deal of tobacco. His occupation of driver exposed him to marked changes of weather. He had never had typhoid fever.

The patient was a tall, rather spare man, of good muscular development, but with

the bleared eyes and congested face of a whiskey-drinker. He stated that he had been feeling ill for seven weeks. During this time his bowels had been irregular, often very loose and watery, at other times regular, and again constipated. Throughout this period he had complete anorexia, considerable thirst, and he felt that he was growing weaker every day. He would go to bed at night tired, sleep poorly and wake in the morning more tired than he had been on going to bed. He did not have epistaxis during this time, but had aching pains in the loins and limbs, and shooting pains through the abdomen, with a rumbling sensation in the bowels. The mouth was parched. He had not been able to work during the seven weeks referred to. He tried to drive his wagon one day, but weakness compelled him to quit. He was, however, not confined to bed, but would be in bed some days and up others.

My first impression on seeing the patient was that he was very ill. The face gave unmistakable evidence of dissipation, the eyes were bleared and sticky. The man lay in semi-stupor; the pulse was small, weak, and beating 100 to the minute; the respirations varied from 32 to 38; the temperature was 103°F.; there was slight cough and scanty expectoration.

* Read before the Philadelphia County Medical Society, October 27, 1897.

The base of the right lung was dull on percussion, but not very dull; the fremitus was slightly increased, the breath sounds broncho-vesicular, and there were a few bronchial and sub-crepitant rales. The disease was at first supposed to be a low-grade pneumonia occurring in an alcoholic subject. The man's condition was so bad that I remarked to the resident physician, Dr. Gerson, that the patient had a very poor prospect of recovery, but that he would do best if given only strychnin hypodermically, his stomach being saved for food and a moderate amount of whisky. This treatment was at once instituted and was carried out through his entire illness.

In a few days, however, it was found that the blood yielded the Widal reaction for typhoid fever, and tubercle-bacilli were found in the sputum. The urine at the same time gave unmistakable evidence of nephritis through the presence of albumin and numerous granular and epithelial tubercasts. The case was now looked upon as probably one of typhoid fever, with nephritis, occurring in a tuberculous subject. This probability was strengthened by the subsequent course of the case, the Laboratory of Hygiene of the Board of Health reporting positively as to the existence of the Widal reaction, and tubercle-bacilli being invariably found whenever the sputum was examined.

The patient's temperature remaining persistently high, it was decided to employ tub-bathing as the only admissible antipyretic measure. On account of the man's feeble condition I recommended warm baths, meaning by that baths at a temperature of 90° F. Probably through some misapprehension of the proper temperature for a warm bath, the patient was put in a tub-bath with the water at 110° F. There was no antipyretic effect; in fact the patient's temperature was higher when he was removed from the water. The resident physician therefore concluded to try cold baths; and on my next visit, finding that the patient bore these better than I had feared, they were continued. From July 20, when the cold tub-baths were begun, to August 13, when they were stopped, the patient had 58 in all. The baths lasted almost always twenty minutes, and the water was at 70° F. The baths were surprisingly well borne. They pro-

duced the usual shivering and blueness of the extremities, and very frequently external heat was necessary upon removal from the bath. Yet the toxicemic symptoms lessened under their use, the stomach and digestion continued good, the heart kept up, there was no aggravation of the lung condition, and the kidneys performed their function better than before. At one time, while the baths were in progress, neither albumin nor casts could be found in the urine.

As to the general symptoms, these and the severity of the case may be judged from the following statements: The man was in stupor alternating with muttering delirium from the day of his entrance into hospital and these symptoms lasted several weeks. At times he tried to get out of bed. He could be roused when spoken to, but would again lapse into hebetude. The stools numbered from three to seven in twenty-four hours; they were liquid, light yellow in color, offensive, and occasionally contained traces of blood. There was no tympanites or abdominal tenderness. During the first week of his stay in the hospital his temperature ranged pretty constantly from 103° to 104°, except as influenced by the baths. From July 26, it took a somewhat lower range; but the tongue continued dry, brown, and heavily coated, and the mental condition did not improve. The urine was passed involuntarily during most of the man's illness, and occasionally there would be an involuntary stool. During the latter part of his first week in the hospital he developed a number of boils—on chest, shoulders, back and legs. These, when opened, left shallow ulcers, which were painful and very slow in healing. One on the back was about the size of a silver dollar, and around it were a number of small openings communicating with the main ulcer under the skin.

By degrees the fever lessened, the mind cleared, and control was regained over the bladder and bowels. The last tub-bath was given August 13. Soft diet was begun August 15. The patient's temperature was then 101°, not varying much night or day. He was judged to be convalescent from his typhoid fever because the toxemia had nearly disappeared, his appetite was improved, and his functions were better performed. The persistence of fever

could be accounted for sufficiently by his tuberculosis, by the ulcers, and by the nephritis.

By August 31 the temperature ranged from 98.6° to 100° F. The stools were small and formed. The urine was about normal in amount. The ulcers were slowly healing.

On September 13, owing to some repairs in the fever ward, the patient was removed to another ward. Here, after a few days, he was found propped up in a chair reading a paper; but very soon he complained of being very cold and weak. His temperature was now subnormal. He seemed to have no rallying power left, and slowly sank, dying September 21, sixty-six days after his admission to the hospital, and approximately six weeks after apparent convalescence from typhoid fever.

Appended are the notes of the autopsy conducted on the day after death: The body was that of an extremely emaciated male, with ulcers on the right leg and the buttocks. The eyes were sunken and rigidity was marked. The mesentery was congested, the mesenteric glands enlarged. The gall-bladder extended two inches below the margin of the liver. The pleural sacs contained numerous adhesions, some of which were easily broken up. The pericardium was thickened and contained about two ounces of fluid. The heart was flabby. There were a few aberrant chords; otherwise the heart was normal. The lower lobe of the left lung was in a state of tuberculous pneumonia, with small areas of tuberculosis in other parts of the lung. The right lung was edematous at the base, with small and large areas of tuberculosis and several small cavities. The bronchial tubes contained a large quantity of purulent fluid. The bronchial glands were enlarged. The spleen was slightly enlarged, its pulp is firm. It presented several small areas (*sic*) throughout the pulp.

The left kidney was enlarged and swollen, the pyramids congested, the cortex narrow and pale; the capsule stripped easily; the surface was smooth; there was a small abscess at the lower part of the kidney, with several small areas in the kidney-substance itself containing cheesy matter (probably tuberculous). The right kidney was slightly smaller than the left; it contained a few abscesses, and its general condition was much the same as that

of the left. The ureters were normal. The bladder was thickened. The glans penis was reddened and excoriated. The duodenum and the stomach were normal. The pancreas was normal. The liver was enlarged, dripping blood when cut. Several small areas (? of tuberculosis) of the size of pins' heads were distributed throughout the gland-substance with evident fatty infiltration. The vermiform appendix was 18 cm. long. Throughout the small intestine were numerous patches of hyperemia and congestion. The mesenteric glands were enlarged. The brain was edematous. A small cyst was present near the pineal gland.

This case suggests several questions of great interest. In the first place, did this man have two concurrent infectious diseases? Did he have tuberculosis and typhoid fever or some other fever, or did he have only the former? I do not think we are yet in a position to say positively that he had or had not typhoid fever. The general course of the disease, the onset of stupor, muttering delirium and looseness of the bowels, with yellow, offensive stools, associated with high temperature, and the gradual subsidence of all these symptoms, speak very strongly for typhoid fever. Stupor and delirium, it is true, occur in tuberculosis, but only in the last stages of the disease or when the cerebral meninges are involved; but in such cases they are progressive to a fatal issue. In this case the man convalesced from the attack, and when later he died the brain gave no evidence of tuberculosis. Again, the presence of the Widal reaction must be regarded as very important testimony as to the present or previous existence of typhoid fever. The blood was examined both by Dr. Kneass, of the Pepper Clinical Laboratory, and by the Laboratory of Hygiene of the Philadelphia Board of Health; and from both sources the report was positive. These examinations were made soon after the patient's admission to hospital. I had supposed that they had been repeated at regular intervals throughout the man's illness, and have only learned since his death that this was not so. This is much to be regretted.

In the absence of marked clinical evidence of typhoid fever, I should not be willing to accept the Widal reaction as sufficient, if only because it has been found in cases of miliary tuberculosis, al-

though not, so far as I know, in the form of tuberculosis presented by the patient whose case is reported.

It has been mentioned that the notes of the autopsy are silent as to the appearance of the ileo-cecal region and of Peyer's patches. As I was not present at the examination I can say nothing from personal knowledge. Dr. Gerson, the resident physician, who was present, tells me that Peyer's patches did not exhibit the shaven-beard appearance one would expect to find, and that there was no evidence of healed ulcers. He says, however, that there was one small ulcer in the intestine. In estimating the negative evidence furnished by the autopsy one should bear in mind that we cannot be certain when the patient's supposed typhoid fever began; nor can we tell when convalescence set in. He was ill for six or seven weeks, with symptoms indicating the onset and development of typhoid fever, before his admission to the hospital. The temperature became normal for the first time on August 8. If convalescence is dated from that day then the man lived fifty-one days. Is it certain that the intestines would show unmistakable evidence of typhoid fever seven weeks after convalescence if the intestinal symptoms, as regards ulceration, had not been prominent during the attack?

Another question of great interest is as to the propriety of cold baths in cases of typhoid fever exhibiting great feebleness and complications on the part of lungs and kidneys. My own preference, as already stated, would be first for warm baths at 85° or 90° F., keeping the patient in them for a half-hour or longer. If these should, after a fair trial, prove ineffective the cold baths might be tried; but after the lapse of the first eight minutes the rectal temperature should be taken every one or two minutes and the patient removed when the rectal temperature reaches 100° F. There is no doubt in my mind that water in some form is the safest antipyretic; the feebler the patient the more it is indicated if high temperatures exist.

Finally, as the value of the Widal serum-test must be decided in accordance with the results of repeated trials, all cases throwing light upon it should be recorded. Dr. Abbott informs me that it has so far failed in only three per cent. of

over 1100 cases examined by the Philadelphia Laboratory of Hygiene.

After a very imperfect search I have found only two cases in the literature which throw any light upon the case just related. One is a case reported by G. H. Lemoine.* Here the patient, a man, aged 22 years, had had typhoid fever when 17 years old. When first seen by Lemoine he was suffering from tuberculosis, but exhibited also typhoid symptoms. Bacilli giving all the morphologic and culture characteristics of Eberth's bacillus were found in the stools; but the Widal test was negative. At the autopsy tuberculosis was found, but no lesions of Peyer's patches. Only colon-bacilli were found by culture, but the autopsy occurred twenty-four hours after death. Lemoine thinks the bacilli were latent in the intestine, and failed to produce typhoid fever because the patient was protected by a previous attack of that disease.

In another and more interesting case, reported by Sarda and Villard,† the clinical symptoms indicated a mixed infection, and the diagnosis during life was typhoid fever associated with acute tuberculosis. The patient, a man 30 years old, died after an illness lasting about one month. At the autopsy, which was very carefully conducted by Prof. Kienér, tuberculosis of lungs, intestines and cerebral meninges was found, but in the small intestine there were other ulcers not tuberculous and some in process of healing. From the spleen the bacillus of Eberth was isolated and cultivated upon a variety of media.

In the growth of olives, California has the monopoly of the United States. The crop last year brought \$250,000 to the growers, and this year it will be much greater. According to a San Francisco contemporary, about seven years are required to bring an orchard into profitable bearing. The California olives are naturally ripened and possess a rich and distinct flavor. The imported Spanish olives are used only as a condiment or relish, whereas in California the ripened olives are largely used as food, being rich in oil and very wholesome. They are being sold in bottles in the principal eastern markets.

—*Assoc. Merch. Journ.*

* *Bull. et mem. de la Société des Hôpitaux de Paris*, 1896, 33 vol. xlii, pp. 675-676.

† *Revue de Médecine*, 1898, xlii, pp. 852-862.

FOREIGN BODY OF UNUSUAL SIZE RETAINED UNDER THE RETROTARSAL FOLD OF THE UPPER LID FOR A PERIOD OF EIGHT MONTHS.*

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H. J. presented himself at the clinic October 12, 1897, complaining simply of a "sore eye," and the following history was elicited.

While chopping wood eight months previously in Russia, a fragment of the wood flew off, striking him in the eye. As the eye caused very little trouble, no special attention was given it. In March last the man left Russia to come to America, and as he crossed to Germany he was subjected to a physical examination; his vision was tried, and as this was good he was permitted to pass. He arrived in this country April 14. The eye was still causing a little trouble; but as it occasioned no special inconvenience, medical aid was not sought.

When he presented himself at the clinic the appearance of the eye indicated a purulent ophthalmia. Upon everting the upper lid there was found, resting securely in the retrotarsal fold, a piece of wood 18 mm. long, 6 mm. wide, and 3 mm. thick,

weighing, when the moisture had evaporated, one and a half grains. The upper lid was covered with a thick tenacious membrane, and at the inner angle was a mass of granular tissue 8 mm. in length, 7 mm. in width, and 2 mm. in thickness. The entire upper lid was somewhat granular in appearance; the upper and inner quadrant of the cornea was slightly hazy; but the bulbar conjunctiva was free from any hyperemia.

The piece of wood was removed, the granular tissue excised, an astringent wash given, and the traumatic conjunctivitis was soon relieved.

The case is reported as one of particular interest; first, on account of the size of the foreign body; second, that it was allowed to remain for so long a time; and third, the little damage to the cornea and adjacent tissues, a possible explanation of which lies in the fact that the piece of wood was macerated and softened by the lachrymal secretions.

TEA DRINKING.

The tea drinking habit that only a few years ago was supposed to be an infallible sign of an old maid, now numbers among its votaries many men, who, for one reason or another, think tea better than more potent drinks. Nearly every big club in New York counts its tea drinkers by the score. They order tea when others around them order whisky.

Five o'clock is the tea drinkers' time, and in support of their habit they say it does not interfere with their appetite for dinner and is as pleasant an aid to social chat as whisky or beer.

One of the regulations of the navy says that nothing stronger than sherry shall be

served in the wardroom, but this doesn't prevent any officer who chooses from keeping whisky in his room. As a matter of fact, however, there is comparatively little heavy drinking done by naval officers in the service. A visitor to one of the boats in the navy yard was talking with several officers in the wardroom one afternoon recently when the senior lieutenant, who had been on deck for four hours, superintending the shipping of several small boats, came below looking chilled through. He ordered the Japanese boy, who was on duty in the wardroom, to bring him a pot of tea. The captain joined him in this drink, and when the visitor expressed his surprise at the mildness of the beverage on a cold day, both officers declared that it was better than whisky when a man was cold.—*New York Sun*.

* Read before the Philadelphia County Medical Society, October 27, 1897.

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COMMUNICATIONS.

RECENT EXPERIMENTS RELATIVE TO THE ETIOLOGY OF
YELLOW FEVER.*

[REPORTED.]

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Some years since I experimented upon a number of small animals with a view to ascertaining their susceptibility to the infection of yellow fever, using in these experiments dogs, guinea pigs, rats, mice, etc. These animals were placed in the hold of a filthy ship, the crew of which were down with fever. They were retained there for a period of twenty-four hours, taking due precaution to observe any changes in temperature, respiration, etc. These experiments seemed to prove that dogs at least are not susceptible. I have never known a dog to fall sick.

In 1888 and 1889, while in Cuba, I performed some experiments in isolating bacteria from yellow fever cases. During these investigations, the micro-organisms which appeared most frequently was the bacillus A. Upon my return to Baltimore pursuing my experiments, I found that this was nothing more than the colon bacillus. I forwarded some of my cultures to the Pasteur Institute and the result of investigation was the same—nothing but the colon bacillus was found. Upon my last visit to Havana I found present in a culture which I had previously made, one bacillus which had not been differentiated. With some of this culture I injected rabbits and found death resulted in three, four, or five hours from the time of injection. This led me to think that there might be something here which should be followed up.

The culture with which these latter experiments had been performed had been obtained from the cadaver alone, and from material kept in the laboratory for some

time. The liver and kidney substance afforded the majority of specimens. This bacillus might have been present in small number in fresh specimens of liver substance and overlooked. I isolated quite a number of this bacillus X which I might say has never been found except in connection with yellow fever.

Not feeling justified upon the evidence before me to publish such information as I had obtained, upon my return to Baltimore I injected two dogs with the cultures and they recovered. Soon after I was ordered to San Francisco but kept the cultures going though I had not laboratory facilities at that place. From San Francisco I was ordered to New York and placed the cultures in the hands of Dr. Wilson with instructions to keep them up. When Sanarelli published his discovery of the morphologic or causative elements in yellow fever, I sent to Dr. Wilson for some of my culture and injected some rabbits. I found that the injection killed but not so soon as before, the period before death being twenty-four hours.

From my own observations I am driven to the following: It is evident to me that the micro-organism described by Sanarelli is identical with the bacillus X which I have described, since, if different, it can have no existence. I followed the method described by Sanarelli to see if I could find his bacillus and cannot admit that any micro-organism capable of developing in any culture media could have escaped my attention. I am driven to the conclusion that the bacillus is the same or that the bacillus of Sanarelli is not the specific infective agent.

The method of isolation pursued by Sanarelli was as follows: In the first case the bacillus was obtained from blood

* From report of the meeting of the American Public Health Association to THE MEDICAL AND SURGICAL REPORTER.

† Surgeon-General U. S. A.

drawn from the finger of the patient the day before death. In the other cases the organism was obtained from the blood of the liver, kidney, etc. Of the cases examined the micro-organism was found in eleven, or in 58% of the cases examined. With the evidence which he had at hand it would appear that he was hardly more justified than I should have been at the time of my first experiments, in announcing this bacillus as the specific infective cause of yellow fever.

When Eberth began his investigations he found his bacillus in not more than one-half the cases examined. Neither Eberth nor Koch conclusively demonstrated the truth of their respective discoveries. Gaskey, four years later, demonstrated that the bacillus of Eberth was present in a considerable number of cases. The conclusive proof of any theory or discovery is generally due to a number of investigators. Neisser found his gonococcus in a considerable number of cases, but did not conclusively demonstrate the truth of his theory.

Sanarelli cannot be said to be the discoverer of the bacillus described, if it be identical with mine.

In the experiments which Sanarelli made with dogs it was found that injecting them with his culture produced fatty degeneration of the liver, obstinate vomiting, fever, hemorrhagic enteritis. It would have been necessary to have made a number of comparative experiments to have conclusively proven his position. Other forms of bacteria produce vomiting and fever.

We are at the present time experimenting with the bacteria X, but shall not be able to report for several months. We have in our laboratory the bacillus of Sanarelli, and shall compare results from the respective cultures. Dr. Reed, an expert bacteriologist, is in charge. We find that cultures containing the bacillus X produce vomiting, fatty degeneration, and hemorrhagic enteritis, proving that its action is identical with that of Sanarelli.

It might be well to say in passing that the bacillus of Sanarelli is motile, the bacillus X is not. It was motile when I got it, but has lost motility. This is not unusual, as bacilli in the process of cultivation are subject to change. The bacillus X has flagella, however, and morphologi-

cally they cannot be distinguished one from the other. They grow in the same media. The comparison is not complete and it is not impossible for different specimens of the same bacillus to vary. This is true of the colon bacillus, different specimens of which have varying fermentative power and pathogenic qualities.

Sanarelli has performed experiments on man with his culture. Upon reading the reports of his experiments the first impression that one would receive might be that one or more of his subjects had died as the result of the injection, and this because he mentions as one of the results of such injection "fatty degeneration of the liver." It is natural to suppose that in order to ascertain the latter fact the post mortem table would come into use.

On the contrary, however, he lost no case, and the condition of the liver was ascertained with the use of the aspirating needle. The cells obtained showed fat drops and granules. Of course this would not be as satisfactory as sections.

With subcutaneous injections the result was not so marked as when the material was injected in a vein. Two c. c. to twenty c. c. were used, the effect depending upon the amount used. With five c. c. there was decided febrile reaction, temperature 40° C., great malaise, pain in the limbs and back, cephalalgia, delirium and coma, and in one case the patient at the end of the second day was collapsed and pulseless. Anuria and albumin in the urine were common; in one case the urine completely coagulating. All the cases finally recovered.

These experiments were made in the presence of other men well qualified to formulate an opinion as to the results, and great credit is due to those who have undertaken them. Further investigation and experiment should be made by men independently of one another. The result of the experiment is not final, but it does seem as though small doses (two c. c. instead of five c. c.) would give the best results.

Among the signs enumerated by Sanarelli as resultant from the injection is a sub-icteroid hue of the skin. In one case two c. c. were given at the first injection, two days later five c. c., and three days later twenty c. c. In this case the reaction from twenty c. c. was much less than

from two c. c. or five c. c. Immunity had been produced.

In conclusion I would say that it appears to me that we are on the right track. That this discovery comes on the heels of the discoveries made in diphtheria and

other infectious diseases seems to lend weight to the probability of the correctness of the theory. We must push our investigations further before accepting positively this new theory. There is a great deal of work to be done.

GENERAL PROGRESS IN SANITARY MATTERS.*

DR. HORLBECK.

The American Public Health Association has grown until there are now 1844 names enrolled in its membership. During its existence some of the most important discoveries in the domain of medicine and surgery have been made, and the science of bacteriology has had its birth and development. Nearly every one of the score or more of bacteria that are pathogenic, and that seriously menace human life, have been found and described in the twenty-five years of the existence of the Association.

Since the last annual meeting the method of diagnosing typhoid fever, as discovered and described by Widal, of Paris, has been elucidated by Dr. Wyatt Johnson, of Montreal. He has shown that when a drop of blood from a typhoid fever patient is brought in contact with a typhoid fever bouillon culture of the bacillus typhi abdominalis there is an agglutination of these bacilli and a cessation of their mobile characterization. This method is now being utilized in a number of cities, and arrangements have been made whereby physicians can send a drop of blood, moist or dry, in a suspected case of typhoid to a bacteriologist who will, in a very few hours, determine the disease.

During the twenty-five years of the life of the association, the process of taking care of contagious diseases have entirely changed. It is now an essential feature of the practice in all communities to confine all such cases to the individual affected. The theories based upon the humors of the blood have given place to a knowledge of the denizens of the blood,

which are being recognized as surely as the flora and fauna of our fields. The microscope gives us the keynotes of our temporal welfare.

It would seem needless to call attention to the great issues involved in a pure water supply, free from disease producing germs. Diseases which are appalling in their death rate are transmitted principally by water. The most common mode of conveyance of cholera and typhoid fever is by water, and many other diseases are believed to be so transmitted. Greater purity is demanded every year. When the supply is taken from lakes every source of pollution is removed; when taken from a river the problem is more intricate and vexatious, and it involves the prohibition of cities situated farther up from using the river as a dumping place for sewage. Where rivers must be relied on filtration, mechanical or artificial, must be resorted to, and a daily microscopic and chemic examination of the water should be made to ensure that the water is free from dangerous bacteria or poisonous compounds.

Great change has been made in the United States in the last twenty-five years in quarantine methods, especially in the shortening of the time of detention, and the methods of disinfection. Detention has been shortened from twenty-five days to fifteen and ten, and in Southern ports, for yellow fever, to five days. Many methods have been in use for disinfecting vessels at the New Orleans Quarantine Station for the past twenty-five years, among which are filling the holds of the vessel with sulphurous acid gas; raising the temperature to 350 degrees F.; placing textile fabrics in a so-

* Address of the President at the Twenty-fifth Annual Meeting of the American Public Health Association, reported for the MEDICAL AND SURGICAL REPORTER.

lution of mercuric chloride. In 1886 a heating chamber was devised to be used in conjunction with mercuric chloride and sulphur fumes, the latter being driven into the holds of vessels by a revolving fan. Many improvements have since been made, and a plant is now in use by which the temperature in the holds of vessels is raised to 230 degrees Fahrenheit, and the personal effects of passengers are disinfected with quickness and certainty and little injury.

It is estimated that over 95 per cent. of all the yellow fever that has reached our shores has come from Havana. A committee of this association has been appointed to bring this vital question before the governments of this country and urge the governments of the countries interested to prompt action in this matter. This body should make a demand on our general government that a commission of expert bacteriologists should be sent to Havana and Rio and be kept there until the materies morbi have been discovered, until the secrets of this marvellous disease have been unfolded. The examples of other countries in the solution of problems involved in cholera, tuberculosis, bubonic plague and leprosy may be noted, why should we not solve the problems of yellow fever? A systematic effort contin-

uously made will be crowned with success. I recommend that a committee from this body be appointed to wait upon the President of the United States to carry out this idea.

There is in every land a profound recognition of the responsibilities of the governing classes, and a preventable disease should be prevented. He referred to the declaration of the New York Board of Health, declaring tuberculosis to be an infectious and communicable disease, and providing for detailed reports of all cases of the disease attended by physicians practicing in that city. He commended the action of the Board to every sanitarian charged with the protection of the public against the spread of preventable diseases.

Reference was then made to the experiments made by the State Board of Health of Massachusetts at Lawrence, on the utility of the filtration of the water supply with reference to the removal of typhoid germs, the average result being the removal of 98 1-2 per cent. A diminution of 60 per cent. in typhoid cases at Lawrence had been the result of filtration. In Memphis, after two destructive epidemics of yellow fever in 1878 and 1879, the introduction of sewers had greatly improved the general health of the city

HOW THE WORLD IS FED.

The extensive shipments of frozen poultry recently made from New York to Europe suggests the vastness of the scale on which the improved arrangements for feeding the world are now carried out. When America was discovered buyers in the largest European produce markets counted by the dozen at wholesale and had minds habituated to the "great gross" as the largest measure of numerical quantity. Now we are obliged to count our eggs and chickens not merely by the gross, but by the million dozen. Last year England actually consumed 133,000,000 dozen eggs, paying \$20,000,000 for them. Ten million of them came from America.

In 1896 England imported 670,000 hundredweight of frozen beef from Australia, and over three times that amount from the United States. A market in

London or in New York would often show within the space of 100 feet products from every part of the world, the shipment and preservation of which over thousands of miles of land and water have been made possible by the process of "chilling."

The refrigerators invented during the last ten years have practically revolutionized distribution, and in doing so have confirmed the supremacy of the United States as the world's greatest provider. Every one knows that we raise grain by the billion bushels, but it is only when we begin to export eggs and poultry by the million dozens and the thousand tons, and the humble hen promises to bring in more money from abroad than the haughty steel industry, that we begin to realize the possibilities and extent of our greatness.—*Exchange.*

CURRENT LITERATURE CONDENSED.

The Work of the Sand Filters at Lawrence, Mass.¹

Lawrence is a New England manufacturing city, with a population of about 50,000. Up to 1875 the water of the city used for all domestic purposes was obtained from ordinary wells. In that year, however, a public water supply system was constructed and the water pumped to the reservoir and distributed to the citizens was taken from the river at a point about one mile above the city.

Nine miles up the river from this intake of the new system was the city of Lowell, at that time having a population about the same as Lawrence to-day, but now containing about 85,000 people. The sewage of Lowell was then, and is now, discharged into the river, and above Lowell are other cities and towns also discharging their sewage into the river and its tributaries.

This water supplied to the people of Lawrence by this system was, then, from the beginning badly polluted, but was evidently purer than the average well water previously used, as shown by a considerable decrease in the death rate of the city following its introduction.

Gradually, however, typhoid fever became more and more prevalent, and finally the death rate in the city from this disease became the highest in the State, being about three times as great per 10,000 inhabitants as the average city in the State.

The cause of the epidemics of typhoid fever which visited the city during months of the year when other cities of the State were comparatively free from this disease, was the polluted water supply, and the question of a new supply began to be agitated. In the meantime, investigations in regard to the purification of Merrimac river water by sand filtration had been carried on at the Lawrence experiment station of the State Board of Health, and had resulted so satisfactorily that as early as 1891 the city was advised to construct a

sand filter large enough to filter its entire water supply, and in 1892 the city government made an appropriation for beginning its construction under the State Board of Health.

In the January following the starting of the filter the number of cases of typhoid fever was 9, or one-eighth as many as during the previous January. This fact is more striking when we note that in Lowell during this month there were 99 cases, or three times as many as during the previous January. In January, 1895, there were 10 cases in Lawrence; in January, 1896, 6 cases, and in January, 1897, 2 cases.

A more satisfactory demonstration of the effect of the filter upon the health of the people of Lawrence can be made, however, by stating that in 1887 the deaths from typhoid fever were 12.00 per 10,000; in 1889, 13.75; in 1890, 13.33; in 1891, 12.20, and in 1892, 11.11. During 1893 the filter was built, and hence during a portion of the year filtered water was being used. In 1894, however, filtered water was in use during the entire year, and the death rate from typhoid fever was 5.00 per 10,000; during 1895 it was 3.07; during 1896, 1.86, and the rate for the present year promises to be exactly the same as for 1896.

Besides giving a water free from disease germs, the filter is also giving a cleaner water, one more attractive and palatable, and containing but 50 per cent. of the organic matter of the river water.

Consumption—An Indoor Disease.²

No form of infection has been studied with greater interest during the past quarter of a century than that of tuberculosis. The prominent characteristics of the disease might be considered as accounting mainly for the fact that consumption bore the characteristics of an indoor infection. Two persons standing or work-

¹ H. W. CLARK, before the American Public Health Association.

² DR. SAMUEL W. ABBOTT, before the American Public Health Association.

ing at a distance from each other of five or ten feet are far more liable to transmit and to receive infection from each other when indoors than in the outdoor air.

In consequence of the peculiar methods under which tuberculosis is spread from one person to another, from the sick to the well, it is therefore desirable that the most careful attention should be bestowed upon the condition of those persons who are compelled either to live or to work indoors. The danger from the consumption of milk and meat of tuberculous animals has been investigated, and thus far, while the danger to be feared from this cause may be said to have passed from the region of possibility to that of probability, that which may be feared from the diffusion of sputum in enclosed areas or spaces may be said to amount to a certainty.

As proofs that consumption is an indoor disease I would call attention, first, to the evidence shown by occupation, and secondly, to the evidence presented by the conditions of age and sex.

It must be admitted that tuberculosis is an infectious disease. Its character is too well defined, both by observation and by experiment, to admit a reasonable doubt. The active principle of infection, the bacillus of tuberculosis, is recognizable; it is capable of isolation from the body, of cultivation and of inoculation into the lower animals. But, practically, the exact mode of infection, when applied to the daily intercourse of human beings, is extremely limited, and no evidence has ever been presented which tends to show that such infection ever occurs by exposure in the open air, either by the breath of consumptives or by the distribution of sputum upon the surface of the soil. On the other hand, abundant evidence shows that such infection is of very common occurrence from indoor exposure to the distribution of sputum deposited upon floors and dried under favorable circumstances.

By this I do not mean to infer that the outdoor free distribution of the sputum of consumptives should be encouraged or allowed, but should be prevented on the general principle that filth of all kinds is a nuisance to the sense of sight and smell, but not because any real danger from such outdoor distribution has actually been shown to exist.

Need of Hospitals for Consumptive Poor.*

Hospitals for tuberculous patients have for some time existed in Europe, but the United States has only two or three supported by private charity and not one institution justly a municipal sanatorium.

Aside from the considerable number of cures which can be effected in a sanatorium for consumptives, especially when the hygienic and dietetic treatment under constant medical supervision is strictly adhered to, there are other sanitary advantages of inestimable value which a community could derive from the creation of one or several sanatoriums for the consumptive poor. In a perfectly conducted sanatorium, where the curable cases are cured, and the hopeless cases cared for so that it is impossible for them to propagate the disease, all patients receive a hygienic education, so as to understand why they should only expectorate in a proper receptacle, what they should do or not do to avoid new colds, why it would be unwise for them to marry as long as they are not perfectly cured, etc., etc. When the patient who has passed through such a sanatorium returns to his home cured or only improved, he will become an educational factor in public hygiene. He will not only have learned to avoid the causes which may aggravate his condition, but he will still use his pocket spittoon and tell his friends that he uses it to protect them from any possibility of getting the disease through him, and at the same time, he will know that through such precaution he also protects himself from reinfection.

The maintenance of this patient in a municipal sanatorium for from three to six months, or even longer during the earlier stage of the disease, will cost the commonwealth no more than if he had been taken to the general hospital for, perhaps, the same period of time, but at a much further advanced and more hopeless state of his disease. If the family were absolutely destitute, the members would have to be supported by the municipality, whether the head of the family were in the sanatorium or general hospital. But since, when treated in time and in a special institution, he has 25 or 35 per cent. more chance of getting well, the likelihood of

* DR. S. A. KNOPF, before the American Public Health Association.

the community being obliged to support a widow and several orphans has thus also been reduced by nearly one-third.

Our prophylactic measures, no matter how strict, will not suffice to do away with the centres of infection daily created anew in our tenement districts. To prevent the hopeless cases from communicating the disease to the large number of susceptible individuals with whom they will come in contact, to give the tuberculosis patient yet in the early stages of the disease, but with little or no means, the best possible chance of becoming a well man and a useful citizen, we need municipal sanatoriums.

Tuberculosis and the Milk Supply.*

Many authorities show that tuberculosis as seen in children starts in a great majority of cases in the intestines. It would be reasonable to suppose that the disease came from the children's food, milk. The disease has been produced by feeding milk to lower animals, and the disease in the lower animals and in man are one and the same.

Dr. Ravenel told of experiments which he had made on 154 guinea pigs. Omitting those animals which had died too soon to show symptoms of the disease and those used to control other experiments, he said: "15 4-10 developed tuberculosis from one single dose of milk derived from cows known to be tuberculous." It was not necessary that the udders of cows should be diseased, he said, for them to give tuberculous milk, and the only way to avoid drinking tuberculosis milk was to examine the herds. The latter was an absolutely certain test for detection of even incipient cases.

He urged the importance of the slaughter of all animals known to be tuberculous, or at least their removal from the herd. Special care should be taken to avoid using milk for infants from even suspected cows. If necessary to use suspected milk it should be Pasteurized or boiled.

The Princess Frederick Leopold of Prussia is undergoing a regular course of training as a hospital and field nurse.

* MAZYCK P. RAVENEL, M.D., before the American Public Health Association.

For Klondike Travellers.

Even the earlier or more fortunate birds who get to the Klondike this fall, will have to be well equipped to stand the Arctic winter, and they can do no mining until next summer. The summer sun, indeed, melts only a few inches of the soil, and great bonfires must be built to thaw out the ground, in the middle of July, before the paying gravel can be dug up for the pan. All the mining of this region is of the placer variety, in which the gravel is mixed with water and whirled in a pan until the few grains of gold settle on the bottom. No huge nuggets are found to be compared with the bonanza strikes of the Californian and Australian gold fields, but a remarkably large percentage of the claims show paying results. —*Scribner's*, Oct., '97.

The Born Teacher is a Rare Type.

Your born teacher is as rare as a poet, and as likely to die young. Once in awhile a college gets hold of one. It does not always know that it has him, and proceeds to ruin him by over-driving the moment he shows power, or to let another college lure him away for a few hundred dollars more a year. But while he lasts, and sometimes fortunately, he lasts till the end of a long life, he transforms the lecture-hall as by enchantment. Lucky is the alumnus who can call the roll of his old instructors, and among the martinets and the pedants and the piously inane can here and there come suddenly upon a man—a man who taught him to think or helped him to feel, and thrilled him with a new horizon!—*Scribner's*, Oct., '97.

Christian Science.

Christian science is one of the most insidious enemies with which legal medicine has to contend. Ordinary laws regulating the practice of medicine can scarcely be construed to apply to those who declare publicly that they are most distinctly not giving medicinal or even medical treatment. With specious claims to literal truthfulness, the Christian scientists can claim that they are carrying into practice what every member of any Christian sect and of many other religious bodies accepts as dogmatically correct.—*Medical News*.

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PHILADELPHIA, SATURDAY, NOVEMBER 6, 1897.

EDITORIAL.

HOSPITAL INTERNES.

THE REPORTER is impelled to make a few suggestions to those whom it may concern, regarding the young physicians who represent one phase of modern medical evolution.

First, a word to those who have the appointing power:—Whether you are a member of a non-medical board of managers or, as is more likely to be the case, a member of the medical and surgical staff, bear in mind that you have a serious duty to perform in the selection of those who are to come into closer relations with the inmates of the hospital than do any other of the medical attendants. Unless you represent a purely private institution, avowedly conducted by and for one or a few physicians, put aside all private and personal interests and discharge this duty fairly and impartially. You are not a politician dispensing patronage—if you be a medical politician, Heaven defend all who come within the reach of your blight-

ing influence—and your verdict must be unbiased by ties of friendship and relationship. You decide whether or not to test applicants by a formal examination. If you decide so to do, abide honestly by the result of your inquisition and expect that such a test will occasionally fail to give you the man best adapted for your needs. Whatever your method of choice, let it be honest, and remember that there are things to consider other than the personal convenience of yourself and colleagues.

To the professional staff:—Once chosen the interne has claims upon the attending staff that may not be overlooked. You must recognize that you are dealing with one old enough and well enough equipped to earn a fair living outside of medicine. This individual is now working for board and washing and for experience. Even if there are ten applicants for one vacancy, give the one elected every opportunity to gain this experience that may safely be

granted. This point is urged because in some quarters, there is a tendency to reduce the status of the interne to that of a mere clinical clerk and to turn over to protégés the surgical, obstetrical and other work which impliedly is the perquisite of the interne. You are in honor bound to consider the physical and moral well-being of the interne. Usually he is inexperienced in the ways of the world as well as in medicine and surgery; too often he is exhausted by the effort to obtain his degree and to secure the position which he now holds. Is his food sufficient? Is he able to do the work that falls upon him? Is he being fatigued by useless red tape? Is his lodging comfortable and hygienic? Is due attention paid to opportunity for rest and privacy? Do you invite him to your home occasionally if he has no friends in the city? Do you give a thought to his habits outside of the hospital routine? Is he learning wholesome lessons from yourself and from the conduct of the hospital? These and similar considerations ought to receive the conscientious attention of the older and wiser physicians who meet this young man and who depend on him for so many details.

To the interne himself:—You must comprehend the responsibilities of your position. You deal largely with charity patients. Many of them are utterly undeserving of the shelter and care which they receive, yet to sternly enforce the law and deal with each according to his deserts is degrading to those in your relations whose only concern is to minister to the outcasts committed to your care. It is not your business to discriminate in applying the benefits of the hospital. It is the duty of your superiors properly to administer the charity they hold in trust. Patience, gentleness, carefulness, personal interest are important qualities in the character of every successful physician. You can scarcely hope to acquire these if you wait till you have a mercenary inter-

est in your patients. Every large hospital is made up of departments, each to some extent independent of the others, and among these more or less friction is inevitable. In becoming part of the hospital machinery, be careful to avoid all needless friction; waive imaginary rights, and do not foster that imitation of dignity which, depending on nothing but delusions of personal importance, is pathognomonic of a "swelled head." On the other hand, you must ever be on your guard against housekeeper, supervising nurse, medical staff and lay manager, all of whom are prone to take advantage of an accommodating disposition to usurp privileges or to divide responsibility. It is never a genuine kindness to another to allow oneself to be imposed upon. Moreover, the man who disregards his own rights too often sacrifices those of others.

But through all, and above all, you will be wise to take to heart the wisdom contained in these old proverbs from the French—"Men who have little business are great talkers. The less one thinks the more one speaks. The young tell what they are doing; old folks what they have done; and fools what they intend to do. Silence is a virtue in those who are not wise; and to be silent is the safest choice for a man who distrusts his own power."

The public should be educated up to the idea that disease is not altogether an evil; that it is simply a manifestation of morbid conditions present; and that if these are removed at all, it must be, as a rule, by the efforts of nature, through the natural forces of the body—the *vis medicatrix naturae*. To check these efforts without removing the cause of the difficulty is to interfere with the natural process and to make the patient worse rather than better. Physicians should continually instruct their patients that nature is the great physician and that if they are cured at all it must be by the recuperative powers of their own bodies, the duty of the physician being simply to aid nature in accomplishing this. —*Modern Medicine.*

CORRESPONDENCE.

"THE COUNTRY SLAUGHTER-HOUSE."

In the issue of the *REPORTER* for September 11, 1897, is an article by Charles Wardell Stiles, of Washington, D. C., on "The Country Slaughter-House as a Factor in the Spread of Disease," which is, in every sense, to be considered opportune and important. The attention of the medical fraternity in general has not been directed to this prevailing evil because many physicians are either individually indifferent, or consider it beneath professional dignity to notice it. Some few, perhaps, may think that to direct public attention to such matters would operate materially toward lessening their incomes, and for this reason remain neutral on the question.

In an article on "Domestic Sanitation," contributed in February, 1897, I endeav-

ored to direct public attention to this existing evil. Farmers very often do their own butchering, with but little regard as to the disposal of the offal. In that article I advised the cremation of offal by means of straw or damaged hay as a fuel. At the same time I believe if butchers would make liberal use of chloride of lime on all such extraneous matter, the possibility of infection would be very much lessened and probably prevented *in toto*.

Dr. Stiles' article commends itself to the careful consideration of every country physician, and, by myself, is heartily endorsed and regarded as a *mint* in the medical firmament.

Very truly,

A. O. STIMSON, M. D.
Thompson, Pa., Sept. 26th, 1897.

Cereal Coffees.

The use of cereal preparations as a substitute for coffee is rapidly becoming popular in this country. One thing can be said in their favor, they are healthful and none of the bad effects of a too liberal use of tea and coffee can be attributed to them. A new process for preparing this malt coffee has recently been discovered in Germany, and is thus described in a consul report: "The invention relates to an improvement in preparing the same, which consists in applying to the grain during the steeping process, an electric current proportionate to the quantity and quality of the grain, whereby the proteid substances existing in the grain are altered in such a manner that, in the subsequent roasting process, only a small quantity of the products of decomposition (as pyridine and its derivatives, which are objectionable to the taste) can be formed, a substitute pleasant to the taste being obtained." Under this patent, factories have also been established in Austria, Italy, France, Switzerland and Sweden. The inventor has also applied for a patent in the United States.—*Omaha Trade Exhibit*.

Blackmailing.

Charges are constantly made against medical men which are most easy to bring and equally hard to refute, so that the matter is usually fought out in court. At first sight it might often seem worth while for a medical man to submit to blackmail; legal proceedings are very long, always expensive, and in cases of this sort not particularly pleasant for the defending side. Small wonder, then, if the busy practitioner is sometimes tempted to buy silence at the price demanded. It is a temptation, however, to which he rarely yields, for he knows very well that the blackmailer is a very vampire who returns time after time until he has drained his victim dry, so that unless he is met and fought at the outset he becomes more and more difficult to shake off. Everyone should remember this point, and medical men of all others, for their honor is their existence; and if they have not time, or think that they have not, or are too poor to battle single-handed, there is an easy way out of that difficulty—namely, by joining one of the societies organized for medical defence.—*Lancet*.

ABSTRACTS.

THE BIOLOGIC BASIS OF MENSTRUATION.*

At the present time there is universal ignorance as regards the causation of menstruation, its meaning as a sexual character, and the method by which it has become established among the higher mammals.

The following views have been advanced to explain the meaning of the process:

1. *Relation to Ovulation.*—For a long time it has been believed that ovulation and menstruation are so closely related that they occur at or about the same time, the former being the cause of the latter.

Of those who hold this view, some think that the blood-discharge results from a general pelvic congestion, supposed to be present during the ripening and escape of the ovum. Others regard menstruation as a process induced by ovulation necessary to the preparation and development of the ovum, in case it should be fertilized.

The following facts relating to maturation and escape of the ovum are now definitely ascertained. These processes are usually in operation some time prior to the development of the phenomena of puberty before menstruation appears; sometimes they occur in childhood and in fetal life. There is no proof at all that pelvic congestion takes place, either coincident with or secondary to these processes, at any time in a woman's life.

Ovulation may also occur without menstruation in the dodging-period of puberty and of the menopause; for several years after the menopause, as Hegar has pointed out; during lactation; in certain diseased conditions, *e. g.*, anemia, phthisis, lead-poisoning. Pregnancy may take place at any of these times. DeSinéty describes an interesting case which he examined, of a woman, 38 years of age, who had never menstruated. In the ovaries there was the normal condition of Graafian follicles, and *corpora lutea* indicating that ovulation had taken place. The body of

the uterus was undeveloped. Then, in abdominal and post-mortem sections made at all times between menstrual periods, Graafian follicles may be found on the point of rupture or recently ruptured; and in examinations made during menstruation, no sign of ovulation may be visible. It is a common observation that extensive disease of both ovaries, *e. g.*, cystoma, suppuration, malignant growth, may not affect the menstrual function to any appreciable extent in many cases.

These various facts seem sufficient to overthrow the view that menstruation is a necessary accompaniment or sequel of ovulation. Yet it can scarcely be denied that there is some relationship between the processes. Removal of the ovaries is followed by cessation of menstruation, though in a certain number of cases this does not happen. As an interesting instance of this, may be mentioned Lawson Tait's patient from whom both ovaries and tubes along with a part of the uterus were removed, menstruation still continuing.

These exceptions have been carefully considered by several authorities, lately by Bland Sutton. He states that the reported cases have been mostly those in which chronic inflammation in and around the appendages has been present, or those in which operation has been performed for myoma uteri. His explanation of the persistent menstruation is that either small bits of the ovary have been left behind, or that in the cases of myoma a submucous tumor may exist leading to hemorrhages. Many cases have undoubtedly been recorded in which after removal of the ovaries for fibroid, menstruation has continued. The long-held view of supernumerary ovaries is discarded by Bland Sutton. He thinks that these so-called structures are merely small bits separated from the main mass of the ovary by deep fissures. In several of these cases of unchecked menstruation, second operations have been performed by which small

* J. C. WEBSTER, M.D. (Edin.), F.R.C.P.E., F.R.S.E., in *Montreal Medical Journal*.

bits of ovary left from the first operation have been removed, being followed by a complete cessation.

2. *Relation to the Fallopian Tubes.*—According to Lawson Tait, removal of the tubes, the ovaries being left *in situ*, is followed in 95 per cent. of cases by cessation of menstruation. This remarkable statement has been little noticed. If it can be established by extended observation, it proves that there is some close relationship between the tubes and the menstrual process.

3. *Relation to a Special Nervous Mechanism.*—Johnstone has advanced the view, supported by Lawson Tait and others, that the menstrual act is a special function, related to a distinct nervous mechanism. They think that possibly a special nerve trunk running in the upper part of the broad ligament may convey the regulating currents. Johnstone suggests that when the ovaries or tubes are removed menstruation is checked because this nerve is ligatured or divided. In the cases in which removal of the appendages is not followed by cessation of the flow, he thinks that the nerve may have escaped division or ligature, owing possibly to its being placed low in the broad ligament.

While undoubtedly believing in this special nervous mechanism of menstruation it seems that possibly the nerve tract is not so limited as Johnstone suggests. The plexiform nature of the nerves about the uterus is so complex that it is presumable that the impulses affecting the mucosa of the uterine body travel by many routes in the broad ligaments.

4. *Relation of Menstruation to Conception.*—By some it is believed that menstruation is a process for preparing the uterine mucosa for the engrafting of the fertilized ovum, that it is in fact, an essential feature. This idea was promulgated when it was thought that the ovum required a connective tissue free from covering epithelium to become engrafted on. I have repeatedly urged its improbability on the following grounds:

a. In all mammals below homo, so far as is known, the ovum grows in relation to the epithelium-covered uterine mucosa and does not require a connective-tissue surface. The uterine epithelium is undoubtedly non-essential, but it is destroyed by degenerative processes and by the trophoblastic action of the outermost

layer of the fetal epiblast. So far as our observations go in human development the same processes occur there.

b. Pregnancy may occur in a girl before the onset of menstruation, at a time therefore, when the mucosa cannot be denuded by that process.

c. It may occur during the lactation period, long after the uterine mucosa has been restored, and at a period in which menstruation is in abeyance.

d. It may take place in one of the periods of amenorrhea during the period of the menopause.

e. It may occur in periods of amenorrhea due to diseases, as anemia, phthisis.

f. Clinical experience of cases of pregnancy following a single coitus proves that development of the ovum may begin at any time, not necessarily immediately after menstruation. (It must be stated that this evidence is of doubtful significance, owing to the uncertainty in our knowledge as to the time it takes the ovum to pass from the ovary down through the genital tract and as to how long the spermatozoa may live in the tract.)

g. Pregnancy may occur in the rudimentary horn of a malformed uterus, menstruation never having taken place in that horn.

h. It may occur years after menstruation has ceased at the supposed menopause. An interesting example is Renaudin's case in which a woman of sixty-two was delivered, though she had not menstruated for over ten years.

i. In male pseudo-hermaphrodites, possessing testes but no ovaries, the vagina, uterus and tubes may be present and menstruation may go on regularly or irregularly.

Another view is to the effect that, along with the maturation of the ovum, the endometrium swells as the first stage in the formation of a decidua which will receive the ovum if it be fertilized. If fertilization does not occur, breaking down of the superficial portion, the so-called "menstrual decidua" occurs, and the menstrual discharge takes place; in this way menstruation may be regarded as the expression of the failure of a process meant to be initial to pregnancy. For, if fertilization occurs, it is thought that the swollen mucosa advances to form the decidua of pregnancy.

There is no proof whatever that changes in the mucosa accompany maturation of the ovum, and the best evidence we possess regarding the alteration in the uterine mucosa during menstruation, the observations of Johnstone, Bland Sutton, Heape, Minot and Mendl goes to show that practically only blood and small portions of the lining epithelium escape. There is normally no exfoliation of a layer worthy the name "menstrual decidua." This term is a bad one; it is to be clearly understood that no change occurs in connective tissue elements of the mucosa during menstruation, viz., enlargement of cells. This change only occurs in connection with the influence of a fertilized ovum.

Löwenthal believes that menstrual bleeding is neither a physiologic function nor an accompaniment of one, but that it is due to innumerable repetitions of an unnatural state of things, viz., the non-fertilization and death of the ovum. He says that the swelling of the uterine mucosa is the result of the embedding in it of the last ovum discharged from the ovary. If this ovum be fertilized the swelling mucosa goes on to form the decidua of pregnancy; if no fertilization takes place, the ovum dies, and as a result of this death a breaking down occurs in the mucosa. He therefore regards the menstrual flow as having all the characteristics of other bodily hemorrhages.

Johnstone believes that the simplest definition of menstruation is a periodic wasting away of the corpuscles that are too old to undergo the changes which must occur in connection with the attachment and development of the fertilized ovum. He does not regard the endometrium above the internal os as mucous membrane, but as belonging to adenoid tissue.

Menstruation is for it what the lymph stream is to the lymph-gland or the blood stream to the spleen. The development of the corpuscular elements, he thinks, takes place in the endometrium, as in the blood-glands, spleen, thyroid, etc.

The existence of menstruation in the human female and its absence in the mammalian orders below the primates he explains by postural differences, and by difference in the structure of the endometrium. From his studies he is of the opinion "that nature has supplied the

endometrium with an abundant lymph stream, which in the unimpregnated state washes away the ripe material to the general circulation exactly as it does any other lymph corpuscle. But in woman, where, on account of its erect position, the uterus has to depend on the tenacity of its own fibres for the preservation of its shape, no such thing as loose tissue of a lymphatic network can be depended upon. So, to preserve the integrity of the uterine wall, the emulgent stream is poured into the cavity of the body, and got rid of through the vagina."

5. *Relation to Body Metabolism.*—Geddes and Thomson in their "Evolution of Sex" have advanced the theory that the menstrual process is related to the balancing of anabolism and katabolism in the female organism.

After puberty a surplus is produced in the system because the anabolic preponderates over the katabolic. When pregnancy occurs this excess is spent in the nutrition of the ovum during its parasitic intra-uterine life and during lactation. When these methods of using the anabolic surplus are wanting, menstrual losses occur in order that it may be got rid of.

Biologic Considerations.—The careful investigations of many forms of plant and animal life by zoologists and botanists have enabled the biologist to establish a distinction between "maleness" and "femaleness" not only in terms of morphologic characters but of psychologic and physiologic reactions. It is only recently, however, that sex differences have been investigated on these more subtle and difficult bases of inquiry. Too long have reproduction and sex been considered by themselves as if they were something to be disassociated from the general physiology of the organism.

The most important sex-distinction which has been established is that which has to do with the general metabolism, or protoplasmic chemistry of the body. Every living cell and every organism is continually representing two forms of metabolism: one, the anabolic, by which nutrition is taken in, waste repaired, energy stored, structure improved or altered; the other, the katabolic, by which potential is changed into kinetic energy and movement or activity manifested, structural alterations induced and waste created.

Throughout the animal kingdom the distinctive and predominant characteristics of the male sex is katabolism and of the females, anabolism.

Generally speaking, the males show activity, continual expenditure of energy, disruptive metabolism; the females, passivity, quiescence, constructive metabolism.

The same distinction is also found in the plant world. The lines of inquiry on which this generalization has been made are the following:

1. A study of sexual characteristics in the fully developed state and in the history of the individual.

2. An investigation into the condition of the lowest forms of animal and plant life, where sex has its beginning.

3. Observation of normal and pathologic changes in the reproductive apparatus.

4. Experimental inquiry into the nature of the factors which determine sex.

As regards the differences found in the adult forms in the invertebrata and among fishes, it may be stated that in general the body temperature is lower in the female. Their longevity is greater. They are in general larger and more sluggish in habits. The males expend energy more freely, thus preventing storage-accumulation and increase in size. Among birds and mammals, while the general metabolic differences exist the males are usually larger than the females owing to special factors which have come into operation and which do not exist in the lower orders of life. Darwin and Geddes have explained these. They show that the differences in size in the higher forms are mainly in bones and muscles. This is explained partly by the extra stress and strain thrown on the males while the females are in a state of pregnancy and caring for the young; partly by the strengthening effect of fights between the males, the strongest tending by natural selection to perpetuate their kind; partly by the effects on the female constitution of the excessive reproductive demands found among the higher animals.

The distinction between the sexes is universally marked in the spermatozoon and ovum, the former being small, active, energizing katabolic; the latter large, passive, highly nourished, anabolic. While the metabolic differences between male

and female have been mainly studied in plants and the lower animals, some work has also been done in the human subject, though here the difficulties are greater owing to the greater complexity of the organism.

Blood.—The red corpuscles are more numerous in the male, and the percentage of hemoglobin greater than in women. The specific gravity is the same until puberty. Afterwards it is higher in men than in women during the sexual life. In old age it is usually higher in women.

It is thus evident that the menstrual life is associated with a fall in the specific gravity of the blood.

Pulse rate.—The pulse rate is slower in men than in women. This holds good for nearly all animals.

Respiration.—Men produce more carbonic acid than women as estimated by the breath. After puberty the amount is nearly double that produced by women. It increases in the latter during pregnancy and after the stoppage of menstruation.

Excretion.—The urine of women is usually lighter in color than that of men, and its specific gravity lower. The amount of urinary solids is both absolutely and relatively less than in the case of men, especially during the reproductive era of her life.

It is highly probable that those features which we call secondary sexual characters, *e. g.*, richer pigmentation, excess of hairs and feathers, activity of scent glands, etc., which are found in the males are but the multiform expressions of the katabolic predominance in the male organism. And it is important to note that in the great run of cases these characters are fully developed as maturity is established. In early life there is practically no physiological distinction between the sexes. The establishment of the reproductive functions is associated with the development of sexual features, which, as Darwin has pointed out, modify the males to a much greater extent than the females, throughout almost the entire animal kingdom. "Generally," he states, "the female retains a closer resemblance to the young of her own species than to other adult members of the same group."

Experimental evidence regarding the influence of various conditions in the production of sex, points also strongly towards the conclusion that "in the determination

of sex, influences inducing katabolism tend to result in the production of males, as those favoring anabolism similarly increase the probability of females (Geddes and Thomson). Poor or abnormal food, deficient light, moisture, exercise, excessive lactation and other conditions tending to diminish the repair-supply or to cause a surplus of waste—the katabolic habit, tend, in experiments made on lower animals, to the production of males. Such tests strengthen the view that the male is the index of a preponderating katabolism, and the female of an equally marked anabolism.

Throughout the greater part of the animal kingdom, this anabolic predominance in the female affords the means of counteracting the katabolic influence of the part she has to play in reproduction. During the sexual life of females among most of the Primates, the anabolic habit does not find sufficient employment in supplying this destructive influence. An overplus exhibits itself in the production of milk during the early period of the child's life, and, after lactation, in a discharge of blood from the uterus. Cases of menstruation during lactation might by this theory be easily explained. The production of milk does not use up the anabolic surplus, which, therefore, becomes disposed of through the sexual menstrual outlet.

In all mammals below the primates the balance is regulated without the occurrence of any loss through menstruation; reproduction, lactation, the care of the offspring and their moving habits apparently making such demands upon the maternal anabolism that no surplus corresponding to the menstrual blood of the human female is produced by the system.

One of the most striking characteristics of menstruation, as observed in the human female, is its variability in type, and in the quantity and duration of the discharge, phenomena which we call the "sexual characteristics." In the majority of cases these features, *e. g.*, activity in ovulation, menstruation, hair-development, growth of breasts, etc., become established at a definite period, known as puberty, which, as we know, varies according to climate, race, environment and other conditions. But of far greater importance are the variations which prove

that there may be no concurrent incidence in the determination of the phenomena in the individual. They are as follows:

1. Menstruation may begin very early in life, even within the first year, without the development of any of the other outward signs of puberty. These become marked, at varying periods in different cases, and in different orders. Generally, they appear together after a number of years, but sometimes the breast changes precede the others, sometimes the growth of hair, sometimes the changes in bodily contour.

2. In other cases, the development of menstruation at a very early period may be associated with one or more of the other secondary sexual characteristics. Thus the breasts may be well-marked, or the external genitals well developed, or the voice altered. The other features appear in later years.

3. In other cases some of the secondary sexual characteristics other than menstruation may be developed in very early life, this function becoming established sooner or later afterwards. Thus the breasts may become well-marked, menstruation following after months or years. In a case recorded by Bouchut, in which the breasts were well-formed at birth, menstruation began at the age of 22 months, and the rest of the sexual features became marked in the succeeding two years, so that at the age of four years the child had all the characters of a fully-developed girl.

Sometimes the breasts and external genitals may develop early together. Sometimes the latter alone may be very early marked, being followed sooner or later afterwards by menstruation and the other phenomena. Sometimes the breasts develop early along with axillary and pubic hairs, being followed after months or years by menstruation. Sometimes the body-contour may resemble the adult form, the hair and external genitals being well developed, at a very early period; the appearance of menstruation and the growth of the breasts being delayed for months or years.

4. As regards the condition of the internal genitals, only a few opportunities have presented themselves of observing them in the above-cited cases, so that it is impossible to know in how many ovulation was in progress or the uterus well-developed. It is, however, clearly established

that in some of these precocious cases ovulation is in progress and the uterus with adult features. There can be no doubt, therefore, that puberty may be completely developed in the first years of life as regards the physical changes. As is to be expected the psychical alterations are wanting.

5. Finally, the cases must be alluded to in which during infancy and child life ovulation has been noted, though none of the other signs of puberty have been present. It has been found in progress even before birth. In the great majority of cases of normal development of puberty, it may be in progress several months before the other phenomena appear.

In the adult state marked variations are found as regards the degree to which the sexual characters are developed. They affect the breasts; the pubic and axillary hairs; the formation of the external genitals; the type, quantity and duration of the menstrual discharge; the psychical development. These differences exist between different races and between the various members of the same race.

From the consideration of the many facts to which I have referred we are forced, it seems to me, to regard the menstrual function as a highly specialized means, gradually produced, in the evolution of the highest mammals by which the two great factors in tissue metabolism—the anabolic and katabolic, are properly balanced. Normally it becomes established along with the various phenomena which characterize the development of sexual activity—at puberty, because it is then that the metabolic habit peculiar to females, viz., predominance of anabolism manifests itself. The rhythmical character of the menstrual function has probably been gradually determined by the forces of evolution, and the marked range of variations which it presents in the human female (unassociated with pathologic conditions) points very strongly to an early period of instability in the process, preceding its present fairly fixed habit. It is, indeed, impossible for us to think of a rational explanation for the peculiarities which are found except on the ground of biologic variations—atavistic reminiscences.

The menstrual function, then, being closely correlated with the well recognized sexual characters is, like them, undoubtedly

ly closely related to a nervous regulating mechanism, the nature of which is unknown as yet. There may be a special cord centre governed by still higher cortical centres, but there is also a subtle and intimate connection between the sexual functions and the general nervous mechanism of the body.

It is this correlation which has been wrongly interpreted, especially in the case of the tubal and ovarian functions, with neither of which is the process directly connected. That it is indirectly related to them and capable of being influenced by them cannot be denied, and that of the whole sexual apparatus the ovaries are the "predominant partner" is not to be wondered at. We have proofs enough as regards their influence on body-metabolism, *e. g.*, in osteomalacia, marked improvement immediately follows removal of the ovaries. Whether this be due, as Curatulo believes, to the secretion by these organs of a chemical substance capable of facilitating the oxidation of the phosphoric organic substances supplying materials for the bone salts, or whether it acts merely by altering an ill-proportioned relationship between anabolic and katabolic functions, thus secondarily affecting the diseased process, is only a matter of speculation.

After the removal of the ovaries in gynecologic practice, certain effects are noted which must be associated with altered neuro-trophic functions. Thus "heats" or "flushes," vaso-motor storms are very often troublesome features. The uterus tends to shrink, the gland-tissue of the breast tends to atrophy, while fat is often increased in the body. There is, however, very great variation as regards the effect of removal on the sexual characters. These are so marked as to demand a careful investigation for the purpose of determining them accurately and of establishing a comparison between the bodily changes following the operation and those taking place in connection with the normal climacteric. At present many exaggerated ideas are current.

While, in the majority of cases, removal of the ovaries is followed by an altered body-metabolism owing to the absence of the most important sexual organ, marked by disappearance of the anabolic overflow of menstruation, it is not surprising that variations should occur in the alterations produced, so that instances might occur

in which the menstrual function does not cease. It is certainly not an uncommon experience to find discharges of blood from the uterus after the operation, apparently, an indication that the changes in body-metabolism are being brought about but gradually in these cases.

As regards the relation of the tubes to menstruation, if Lawson Tait's observations be accurate, viz: that after their removal menstruation ceases in the great majority of cases, the ovaries being left behind, the explanation may be either that such a marked alteration in the genital tract may reflexly alter all the sexual functions along with body-metabolism, or that it may bring about the result through an indirect influence (such as inhibition of function) on the ovaries.

Bland Sutton's statements as regards the effects of removal of the tubes are directly opposed to those of Lawson Tait. His words are, "the Fallopian tubes exercise no influence on menstruation," and in order to produce artificial amenorrhœa both ovaries must be completely removed." I do not consider that Bland Sutton is justified in making these statements from the facts given by him. He quotes a few cases in which ligature of the tubes was performed without causing a cessation of menstruation. Tait, however, speaks of removal of the tubes, a much more serious disturbance.

Though there can be little doubt that menstruation has been established in the higher mammals by a gradual process of evolution, we have been entirely in the dark as to the steps of this process. Seeing that it is limited to the anthropidæ and simiadæ, the earliest appearance must have taken place among some common ancestors of both. The peculiarity probably first began as a variation, which proved to be advantageous, and by natural selection became a fixed character, being transmitted from generation to generation. Had it been of no advantage it would have been eliminated. The only suggestion which has yet been advanced as to the possible advantage of this variation is that of W. E. Fothergill, who believes that it consisted in a greater tendency to conception owing to the rawing of the uterine mucosa.

This suggestion cannot be entertained in the light of present knowledge. We

know that rawing of the surface is not necessary to the attachment and nidation of the fertilized ovum, and that in the great mass of the mammals it does not occur. The introduction of menstruation in the evolution of the mammalians has not been associated with greater but with diminished fertility, for there can be no doubt that the non-menstruating mammals are on the whole by far the most prolific. Indeed, natural selection has acted in the highest ranks of the animal world not in the direction of establishing a numerical superiority, but one based on the specialization of individual characteristics in a selected number. The advantage of the variation in our distant progenitors must therefore be sought for in relation to factors tending to diminish the number of offspring and to improve the quality of the individual.

As to the origin of the variation, the only reasonable speculation seems to be that it is associated with the development of the single uterus, with the diminution in the number of offspring, with the determination of the semi-erect or erect posture, characteristics found throughout the primates, at least in the simidæ and anthropidæ.

Of prime importance, I believe, among these factors is the change from the bicornuate to the single condition of uterus. In the great mass of mammals with the former variety, the excess of anabolism is used up in the large demands of breeding and nursing. When the single uterus appeared as a variation marked by a diminished area for the attachment of ova, the unused anabolism found an outlet in the escape of blood. It is possible that this took place at first from different parts of the body, thus helping to explain the occasional occurrence in females of "vicarious menstruation." If this were the case, natural selection must have acted in eliminating all except those in whom the blood escaped from the uterus. But it is also likely that the tendency to sit on the ischial tuberosities and to move about more or less in the semi-erect position may have somewhat determined the occurrence of the congestion chiefly in pelvis, relief being found by a discharge from the delicate mucosa. The blending of two blood-supplies in a single uterus, which had previously been distributed to

two cornua, must have had an influence in inducing a special tendency to uterine congestion.

Probably also another factor helped to determine the localization of the congestion to the pelvis, viz.: the habit already fixed among many of the lower mammals of the periodic pelvic congestion of the rutting period. In the beginning it is likely that the menstrual discharge took place at irregular intervals (thus explaining the occasional irregular types which are now found among females). Natural selection would here come into play in determining regularity of type. Females who were irregular in regard to the discharge would be objects of inconvenience to the males who would very soon learn to seek out and prefer those whose unseemliness manifested itself only at expected and definite periods, and so gradually regularity would come to be the predominant feature in succeeding generations of offspring.

It is a striking fact that among all races there is a careful avoidance of menstruating females by the males. This is particularly marked in most primitive peoples. Very possibly it had its origin in a feeling of disgust on the part of the males, and it is not difficult to understand how among the earliest human beings there might gradually develop the belief that women were possessed of some unclean or evil spirit which had to escape periodically. It is thus easy to explain the universal though varied customs and practices prevalent in many races, by which the woman is forced at her periods to avoid association with others, to abstain from coitus with men, and to withdraw even from observation in order that her evil influence might not spread.

Next, it is of great interest to inquire into the possible gains that might result from the fixing of the process in females. It is a remarkable fact that in the highest mammals, viz.: the simiadae and anthropidae, is found the highest development of the altruistic principle as exhibited between parents and offspring. As Westermarck points out, among the invertebrata the male is interested only in the act of fertilization, while the female shows no further concern or responsibility after she has laid her eggs. In the lower vertebrata parental care is almost unknown, though there are a few exceptions, *e. g.*, chiefly

in the chelonia; the males caring for the young in some cases, the females in others, while in a few instances there is joint parental attention. In the birds, however, it is the rule that the parents live in most intimate relationship, both during and after the breeding season, the female hatching and rearing, the male acting as protector and provider of food. Among the great mass of mammals, below the primates this is not the case; the mothers alone showing great concern for the young offspring while generally the males are only interested in the females at the rutting time. Exceptions are found, however, *e. g.*, among whales, seals, certain deer, moles, squirrels, and a few other forms; the parents remain together after the birth of the young, the male acting as protector.

Among the primates the rule is that the males and females unite in a more or less enduring partnership, both having great concern for the care of the offspring, the males possessing one or more wives. There is an abundance of facts to establish this statement, and from them Westermarck has established his induction in a masterly work, that our human marriage is an inheritance from an ape-like ancestor, controverting the long-held belief of Sir John Lubbock and others that our progenitors formed one vast free-love community where promiscuity of sexual intercourse prevailed. This habit is therefore another interesting possession of mammals with a single uterus. It marks a great advance in the character of the individual above the types found in the lower orders of animal life. Very evidently it was fostered by means of natural selection, being most essential where the female gave birth to a small number of young who passed a long time in a state of helpless infancy and tutelage. Such a species, undoubtedly, stands a better chance of surviving when the parents unite their energies in the task of protecting and nurturing the offspring. Indeed it would appear that the great determining factor of conjugal relationship is care for the young. Among several primitive races (and in some of the highest) marriage is never supposed to be established until offspring appear.

Wherever in the animal kingdom we find that the parents have no concern with their offspring, the females give birth to

a very large number of offspring—the prodigality of births allowing of the safeguarding of the preservation of the species. Thus the cod lays each year about a million eggs, to which she gives no after-care, and probably the greater number become destroyed. On the other hand the turtle-dove lays only two eggs, but owing to the care which the parents give to the young they generally grow to maturity.

Another important point to notice regarding intercourse between the sexes, is that while among the majority of mammals there are special times of pairing, conditioned by various necessities, different in different species, among the quadrumana the rule is probable that fruitful intercourse may take place at any time, though undoubtedly exceptions occur owing to conditions of food, environment, etc. In the evolution, therefore, of the higher mammals possessing one uterus, there has been a departure from the condition of periodic excesses of sexual rioting to one in which there is, especially in the female, a more diffuse and consequently less intense manifestation of the sex instinct.

The menstrual function occurring regularly in animals so placed, must have served beneficially in giving the mothers continually recurring periods of ensured rest (for so far as we know coitus is universally desisted from during menstruation) and in teaching the males continual lessons in self-restraint.

Relation of Menstruation to Rut.—There is a wide-spread belief that these phenomena are identical. Thus a very recent writer (Letourneau) states that "menstruation is essentially identical with the intimate phenomena of rut in the females of mammals and corresponds to an ovarian congestion, or to the swelling and bursting of one or more Graafian follicles." A few writers have in recent years disputed this view, among whom may be chiefly mentioned Lawson Tait.

There are many who believe that the rut or oestrus, or pairing time, is conditioned by ovulation—that ova are only shed at these intervals causing the phenomena. There is no basis of facts for this statement. The examination of many rutting animals proves that ovulation goes on at all times. The origin and significance of rut are uncertain, but it seems probable

that the habit has been developed by natural selection for the purpose of limiting the chance of fertilization to certain seasons mainly with reference to dietetic and climatic requirements for the offspring. Among the mammalians this period is found at all times of the year. Thus, the bat pairs in January and February; the wildcat and fox in February; the weasel in March; the musk-ox in August; the badger in October; the crongo-antelope in November and December.

When the different cases are enquired into it will be found that the time of pairing is related to the duration of pregnancy, it being necessary that the young should be born at a time when they stand the best chance of living. Thus the majority of mammals produce offspring early in the year; in the tropics at the beginning of the rainy season—the time of birth evidently being related to abundance of food, water, warmth of climate, conditions most favorable to existence. In polar and temperate regions the animals pair at a later period than in warm countries. These differences are seen when the same species are placed under different climatic conditions. When no definite pairing system exists, as among elephants, whales, many rodents, the explanation is very evident. The conditions of their environments and of their food supply are such as not to necessitate the birth of offspring at special times.

Among the primates it is doubtful if there is a rutting season among many species. It is stated by some observers that it exists in the orang-outang and gorilla. In general it is to be expected that in the simiadae and anthropidae, whose food supply is of a much more diverse nature than in the lower mammalians, consisting of animal and vegetable matter in different forms, there is no necessity for the birth of offspring at special times. Moreover, it must be remembered that the anxious time as regards the newly born does not last only for a few months after birth in the simiadae, but for years, the period of infancy being long just as in the case of *homo*. It is therefore likely that as far as food requirements are concerned one season is as propitious as another for birth.

Another important factor must be borne in mind, viz.: that where there is a strong development of parental affection

and conjoint parental care for the young, an important additional reason exists for diminishing the necessity of special pairing seasons. This is all the more marked in the anthropidæ where, owing to a higher intelligence, individuals learn to combat the injurious influences of their environment and to make it possible for the offspring to have as good a chance of surviving at one time of the year as at another. If then, there be found exceptional cases of special pairing season among the higher primates, it must be because natural selection has conserved the habit in relation to the special conditions in which those species are placed.

Among the reptilians and birds, the rule is that pairing occurs in the spring, and it is probable that, as Westermarck points out, the world-wide association of the springtime with the awakening of sexual affinities has been based upon the observations made mainly on birds. The modifications in the pairing season which can be induced by artificial means, *e. g.*, domestication, are a strong evidence in favor of the influence of external influences on reproduction among the higher vertebrata. Indeed, it is evident that just as rut becomes adapted to the requirements of separate species, so it may become altered in relation to the needs of individuals under varying conditions.

Another interesting fact must be mentioned, viz.: that while the rutting-period is practically the only time when the females will copulate with the males, the menstrual period is the time above all other periods when they will not engage in this act. This is universal among mankind, and is true for the simiadae as far as our observations go. Moreover, the changes in connection with rut result among other things in softening and dilating the outer genitals for the reception of the penis, they being at other times in many animals too much constricted for this.

So far as our facts go, it seems likely that rut in the higher vertebrates is merely the expression of the force of sexual affinity necessary to ensure fertilization of the ovum, which is found throughout the whole animal kingdom, diffusely spread in the lower forms, highly specialized and limited in the upper forms owing to the influences of environment and natural selection, and affecting both males and fe-

males alike. This participation of the males is important to bear in mind. Among mammals the intensification of sexual desire in the males, accompanied with a feeling of jealousy and a keenness to fight, is universal. In all orders the voice is used in the rutting-time more than in any other season. Indeed, the porcupine and giraffe are said to be mute at all other periods. In stags, the larynx and thyroid enlarge when rut comes on. The nose of the male sea-serpent becomes greatly elongated. In the bladder-nose seal the hood covering the head becomes markedly inflated. Scent-glands emit strong odors. In some cases the color of the skin changes. Among the great majority of females no such marked changes occur. They play their normal role of passivity, the changes brought about by the wave of sexual excitement being mainly psychical.

In many mammalians the only physical changes recognizable at the oestrus are congestion of the soft parts in the pelvis, dilatation of the vulva and the vagina, and the free discharge of mucus which is often blood-stained. These differences between males and females in regard to the rutting period are in keeping with the organic distinction to which I have so often referred in this paper. The manifold changes in the males are the outcome of their predominant katabolism. The females need to conserve their energies, *i. e.*, their anabolic surplus, for the strain of pregnancy; consequently there is no waste in outward exuberant manifestations, except in very slight measure in the cases to which I have just alluded.

Finally, it may be stated that the relation of rut to menstruation in mammalian evolution is simply this—that when, owing to the various reasons which I have elaborated in an earlier part of this paper, menstruation appeared as a new variation, one of the factors in determining the escape of the anabolic overplus by way of the genital tract was the habit already fixed in many of the mammalians, with a bicornuate uterus of the periodic yearly pelvic congestion of the rutting time.

A mother ten years and two months old, with a plump, healthy baby, is reported by the *American Journal of Surgery and Gynecology* as the youngest yet heard from.

SOCIETY REPORTS.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated meeting, October 27, 1897.

The President, DR. JAMES TYSON, in the chair.

DR. HERMAN B. ALLYN read a paper entitled

Typhoid Fever Occurring in a Tuberculous Subject and Complicated with Nephritis.

(See page 577.)

DISCUSSION.

DR. A. A. ESHNER said that he had had the privilege of seeing the patient whose case was reported on one or more occasions while he was under Dr. Allyn's observation, but he had little to add to what Dr. Allyn had so well said. He referred to another case, which was in the same ward at the same time and which exhibited many of the same symptoms as Dr. Allyn's case. The case was that of a colored man, about 45 years old, who presented on admission to the hospital symptoms considered to be diagnostic of typhoid fever. Blood was withdrawn from a finger and sent to the Bacteriologic Department of the Board of Health. The report came back that it yielded a positive reaction to the Widal test. The case was therefore looked upon as absolutely one of typhoid fever, and the patient was bathed strictly according to the method of Brand. His temperature remained persistently high, although it yielded somewhat to the baths. The man bore the treatment exceedingly well for some four or five weeks, when, the temperature still failing to decline, other specimens of blood were sent to the Board of Health laboratory. The reports upon these came back as to the negativity of the Widal reaction. Upon inquiry, stating that the original observation had been positive, while the subsequent ones had been negative in regard to the Widal test, we were informed by the bacteriologist in charge that the original observation had been reported as positive through a clerical error, and it should have read negative.

The long-continued high temperature, the failure to yield to treatment of all sorts, kept us on the alert for signs of miliary tuberculosis, and this watchfulness was increased when report was received that the Widal reaction was wanting. For a time we were quite unable to find any significant symptom, except the persistent elevation of temperature; but finally small areas of dullness appeared in one lung and breathing in one situation became coarser than in others,

with increased vocal resonance and fremitus. There was little or no sputum, and tubercle-bacilli were never found in that which was examined. The blood also was examined, without the detection of the bacilli; nor was the crepitant fremitus, the tactile fremitus, which is sometimes appreciable in cases of miliary tuberculosis, to be detected in this case.

The case continued to progress pretty much in the fashion related, and as it went on, delirium developed and the man grew progressively worse, and death finally ensued, after having been under observation for some ten or twelve weeks. Unfortunately, through misadventure, an autopsy was not held, and we are without positive evidence as to the real nature of the case. My own conclusion, however, is that at no time did the patient have typhoid fever, that the case was one of miliary tuberculosis from the outset, and that the terminal symptoms were probably due to tuberculous meningitis. The case has no special bearing upon the one which Dr. Allyn has reported, nor has it any special significance in regard to the value of the Widal reaction. There is no obvious reason, however, why typhoid and tuberculosis infections should not be concurrent in the same case.

In the case of a girl who was admitted to the hospital at the same time as her brother from one house, and in both of which cases a provisional diagnosis of typhoid fever was made, specimens of blood sent to the Board of Health yielded in the one instance a response which was designated as doubtful, and in the other a positively negative one. The case of the boy was under the observation of a colleague. The case under Dr. Eshner's observation went on, and developed a mild attack of typhoid fever. Convalescence was followed by a relapse, which pursued a more grave course than the original attack. In the course of this renewed infection examination of the blood yielded a positive reaction to the Widal test. It is possible that in one or both of these cases a mild attack of typhoid fever gave rise to the development of agglutinating substances in so small a quantity or of such slight activity that they failed to yield the diagnostic reaction, but upon passing through a second attack, a relapse, which was more aggravated than the original attack, the blood then yielded the typical reaction.

DR. D. B. BIRNEY said that in most of the cases in which he had sent specimens of blood to the Board of Health, the reports

have come correctly, as shown by the subsequent course. In the case of a man, however, two specimens of blood were sent to the Board of Health, and the report came back negatively in both instances, although subsequently the patient passed through an undoubted attack of typhoid fever.

DR. JAMES TYSON said that there has recently come under his observation the first instance of a positive Widal reaction in connection with the presence of spots and the absence of other symptoms of typhoid fever. A man was admitted to the University Hospital with the prodromal symptoms of typhoid fever. He presented distinct spots, but fever did not develop, the febrile state with which he entered disappearing, and soon the man seemed perfectly well. Specimens of blood were sent to the city laboratory twice, with a positive reaction reported. A further specimen, examined in the Pepper laboratory, likewise yielded a positive Widal reaction. Careful inquiry elicited the fact that the man had never had typhoid fever. He was kept under observation for a couple of weeks for safety's sake.

DR. H. B. ALLYN said that the chief interest in the case reported lies in the possibility of determining accurately the concurrence of tuberculosis and typhoid fever. As yet it cannot be stated positively whether that is or is not possible. The clinical course of the disease is more significant than the presence of Widal's reaction. The continued high temperature, with stupor, delirium, looseness of the bowels, and incontinence of urine, are significant when it is remembered that they were entirely recovered from. There must have been some infectious agent at work aside from the tuberculous process. If the cerebral symptoms were purely tuberculous they would have progressed steadily until death, for the mental state of patients delirious

from tuberculosis meningitis rarely, if ever clears up.

DR. J. W. CROSKY read a paper entitled **An Unusually Large Foreign Body Carried in the Upper Lid Under the Retrotarsal Fold for the Period of Eight Months,** and exhibited the specimen and the patient. (See page 581.)

DISCUSSION.

DR. C. A. VEASEY said that all who have to do with ophthalmic work have met with cases similar to Dr. Croskey's, though perhaps not so marked. He related the case of a little girl, four or five years of age, who came to the Jefferson Hospital Ophthalmic clinic with a severe muco-purulent conjunctivitis. Her mother stated that this had been present for four months. It had been variously treated, with very little improvement, so that great care was taken to ascertain the cause. Upon everting the lid and looking well up into the retro-tarsal fold a very small dark spot was found which seemed to be not a portion of the conjunctiva, but something imbedded in it. Upon seizing this with a pair of forceps and making an attempt to draw it out, a piece broke off which, when thoroughly washed proved to be a bit of cedar. The conjunctiva was cocainized, an incision made, and a piece of cedar dissected out about three-eighths of an inch long, with several prolongations that had become almost entirely imbedded beneath the conjunctival surface, the only point showing in the situation stated. The mother at once recalled the fact that the child had fallen against a Christmas tree sometime during Christmas week, and her eye-trouble dated from that time. The muco-purulent conjunctivitis, which was due to the foreign body, at once cleared up with its removal.

PERISCOPE.

Some Curious Bullet Wounds.—The extraordinary course often taken by bullets after they have entered the body is of course one of the familiar facts of medicine. In a recent case the bullet entered the mouth, which must have been open at the time, and made its exit above the shoulder blade. Here it seems possible that both base of skull and spine may have been concerned in this curious deflection. In another case, a man who was shot transversely through both hips felt no pain at the site of the wound, but suffered excruciating agony below the right knee, evidently due to impingement of a nerve trunk. One of the most extraordinary bullet tracks on record was described in a recent issue of the *British Medical Journal*. The patient was a Cretan Musselman, who was struck by a ball from

a Gras rifle. The missile first caused a comminuted fracture of the left thumb, which was in contact with the chest wall. It then entered the chest two inches above, and two inches to the inner side of the left nipple, glanced round the ribs to the left scapula, which deflected it downwards to the crest of the left ilium. It then passed nearly vertically upwards and made its exit about an inch and a half inches below and in line with the inferior angle of the left scapula. The said up its billet this energetic bullet tore off a large piece of the pectoral muscle of a child that the old man appears to have been carrying on his back.—*Med. Press*.

There are 8232 medical students in the 21 German universities.

Mr. Battle operated on a married woman, æt. about 40, for a large cystic sarcoma in the left abductor region removed by Mr. McKellar. The patient had suffered severely from shock at the first operation, when although it was considered probable that local recurrence would soon take place, amputation at the hip-joint was not recommended. Three weeks before the present operation a cystic swelling, which had formed rapidly in the site of the original growth, was opened to relieve pain; through the opening there had been a rapid extrusion of growth; from this fungating mass hæmorrhage had commenced, and the patient was rapidly going down hill. No means of stopping the hæmorrhage appeared likely to be effectual short of amputation, and the situation was explained to the husband as well as to the patient herself. They were told it was unlikely more would be gained than the arrest of the bleeding which was the chief danger for the moment. The operation was performed in the following manner: A subcutaneous injection of strychnia and morphia was given before the administration of ether commenced. The right leg and both arms were bandaged with flannel bandages. The operation was carried out on a hot-water table. The left leg was bandaged with Esmarch's bandage to the level of the tumor; the region of the growth, and parts implicated in the incisions were thoroughly cleansed; pressure had to be maintained for a time on the growth itself as bleeding commenced from it. Battle first ligated the femoral just below Poupart's ligament; one or two enlarged glands which were divided did not present evidence of growth; two or three small arteries spurted vigorously. A square-shaped flap (about five inches long) containing no muscle and formed from the front and outer side of the thigh was rapidly dissected with a stout-bladed knife. The posterior flap was formed in a similar way; the muscles severed close to the bone; the hip-joint opened, and the femur rapidly disarticulated. The vessels which spurted were readily caught with forceps. The growth at the junction of the inner end of the two flaps, which rendered it necessary to make the flap antero-external rather than strictly anterior. The stump was washed with hot perchlorid solution, and rapidly closed with catgut sutures, pressure being applied to arrest any oozing. As the incision was carried through the hip-joint the patient was severely shocked, and although the operation was quickly performed, she required the administration of two pints of saline solution before she improved; the left median basilic vein was selected, as the other arm had been utilized previously in a similar way at the first operation. The patient then had an injection of morphia given to her. The effect of the saline injection was good, and the woman was removed from the operating theatre in very fair condition; a little later, however, she became collapsed again, but revived satisfactorily under inhalations of

oxygen. Battle had not recommended operation before, because the growth was high up, and it was not possible to remove affected muscles at their origin; it was doubtful if at any time an amputation would have permitted visible growth to be removed; there was also a probability that the patient had some lung infection, although there were no signs of it at the time. Had there been any evidence of lung implication, he would not have operated, because the prospect of prolongation of life would have been so very slight and the risk of the operation would have been greater than she would have been justified in undergoing, but, on the other hand, danger of death from hæmorrhage was so great that he had advised the patient's consent. The growth was not considered very malignant, as it contained numerous myeloid cells, and the glands were not invaded. The patient has since progressed favorably.—*Med. Press.*

Dr. Giuseppe Levi, of Florence, has by his recent investigations and experiments thrown some light on the question raised by Bunge in his *Lehrbuch der Physiologischen Chemie*, as to whether the work of excreting large amounts of sodium chlorid did not irritate the kidneys, so that salt, as well as alcohol, might be put down as an exciting cause of nephritis. Dr. Levi has experimented upon dogs and rabbits, and comes to the conclusion that large amounts of common salt, from four to four grammes daily for each kilogramme of the animal's weight, given for an extended time, do give rise to renal changes. He does not speak of the lesions as constituting nephritis, yet an inflammatory condition was present. The epithelium and the connective tissue were affected, and the lesions were similar to those which authors attribute to various toxic substances.—*Deuts. Med. Zeit.*

Science is a first-rate piece of furniture for a man's upper chamber if he has common sense on the ground floor; but if a man has not got plenty of good common sense, the more science he has the worse for his patient.—*OLIVER WENDELL HOLMES.*

Egg albumen, raw, serves both as food and medicine in certain conditions. To give it, drain the albumen through an opening about half an inch in diameter at the small end of the egg, the yolk remaining inside the shell; add a little salt and direct the patient to swallow it. Repeat every hour or two. In typhoid fever this mode of feeding materially helps us in carrying out an antiseptic plan of treatment. Furthermore, the albumen to a certain extent may antidote the toxins of the disease. Patients may at first rebel at the idea of eating a "raw" egg, but the quickness with which it goes down without the yolk proves it to be less disagreeable than they supposed, and they are very ready to take a second dose.—*Pacific Med. Jour.*

Orthmann (*Centralb. f. Gynak*) endeavors to make the subject of tuberculosis of the ovary fairly clear from a clinical point of view. He has collected 177 cases. Only 57 were carefully submitted to microscopic research; of these 48 seemed to be instances of pure ovarian tuberculosis, bilateral in more than half (27) the cases. The remaining 9 were tuberculosis ovarian cysts. In spite of theories of infection from the outer entrance of the genital tract, and notwithstanding the tendency of pathologists to make out primary disease where it has not been detected before, Orthmann declares that primary tuberculosis of the ovary has never been satisfactorily distinguished in woman, though Acconci and Schottlander have experimentally produced it in animals. In the 48 cases above noted as pure tubercle of a previously sound ovary, infection was traced from the Fallopian tube in 26, and from the peritoneum in 22. The disease may appear as tuberculous perioophoritis, disseminated or diffused, and as miliary tubercle of the substance of the ovary (20 out of 48 cases), cheesy tubercle or tuberculous abscess. The two latter are about equally common. The former, much more frequent, may pass undetected by the naked eye, but the disease shows its features very characteristically under the microscope. In the 48 cases, tubercle bacilli were detected 9 times by the microscope and 4 times by experiments on animals. Orthmann describes 4 new cases under his own care. In one there was distinct tuberculosis of the yellow substance in a corpus luteum.—*Brit. Med. Jour.*

Giant-Cell Growth upon the Peritoneum and Ovaries in connection with Intra-Uterine Pregnancy. (Dr. Schmorr, *Monatschr. f. Geburt. u. Gynak.*). For a long time the presence of a new growth of tissue, composed of large cells similar to those of the uterine decidua, upon the pelvic peritoneum in connection with an extra-uterine implantation of the ovum was thought to be characteristic of abdominal or tubal pregnancy. Recently, however, Pels Leusden found the same nodular growths upon the pelvic peritoneum of a woman that had died of eclampsia during a uterine pregnancy. Schmorr found these also in thirty cases of intra-uterine pregnancy. They occur most often as grayish-white nodules of varying size, sometimes scarcely distinguishable from tubercles, often raised above a highly injected peritoneum and having a thin fibrinous exudate. These nodules may be confluent, forming patches, and less frequently they present a papillary appearance .5-1 cm. long. The favorite location is upon the walls of Douglas's pouch. They are found frequently upon the ovaries also. Microscopically they resemble uterine decidua closely, being composed for the most part of very large irregularly shaped, branched cells containing a large readily stained nucleus. The nucleus contains a

distinct nucleolus and is sometimes swollen and irregular in outline. In the newest growths the protoplasm of the cells is homogeneous and easily stainable with eosin. Hematoxylin stains it a gray-blue color. Here and there vacuoles are seen which in the fresh tissues are filled with shining globules giving the distinct glycogen reaction. Older growths show fatty, edematous, and mucoid degeneration. A minute description of the histology of the growths is given, and the author believes they are true new growths of peculiarly metamorphosed connective-tissue cells. The period of pregnancy in which they first appear is uncertain; they have been found as early as the fifth month. They have not been found in any condition except pregnancy, and are therefore believed to be caused by some special irritation of the connective-tissue cells due to gestation. The growths usually disappear completely with the puerperal involution of the uterus, but sometimes remnants of them may be found in the shape of sand-like calcareous nodules in Douglas's pouch.—*Univ. Med. Mag.*

Burns in which the skin is blistered but not broken may be very satisfactorily treated by means of a thick paste of bicarbonate of sodium and water spread upon the parts. By means of osmosis the serum is abstracted from the blister as fast as it forms, so that the separated skin soon becomes adherent to the surface beneath, and in the course of a day or two the blister will disappear, and in its place will be found a flat surface covered with a thickened skin much resembling a callous. Great care should be taken to avoid breaking the skin, so that the serum beneath will not be infected. So long as an aseptic condition is maintained, suppuration will not take place, and a cure may be accomplished in a few days instead of requiring several weeks. The application of soda also affords prompt relief from pain. Ichthylol may be used in the same manner; it should be painted over the affected part and covered with a thin cloth or tissue paper. The application should be renewed, if necessary, several times daily.—*Exchange.*

Recent physiologic investigations have shown that the motor system is double throughout the body, consisting of two sets of nerves, one of which has the power to annihilate the function of the other. These nerves of opposite function sometimes follow different anatomic tracts, though they are often united in the same nerve-bundles. The vagus has been shown to be both an inhibitory and a motor nerve of the lungs.

An ointment of belladonna and mercury, equal parts, is useful to relieve the pain of thrombosis, if applied over the course of the vein.—*College and Clinical Record.*

Paralysis Agitans at Thirty-four Years of Age, immediately following Typhoid Fever (Frank R. Fry, M.D., *Jour. Nervous and Mental Disease*, November 7). I examined E. S—, aged 37 years, attitude, tremor, gait, speech, facial expression, are all typical of paralysis agitans. The rhythmic agitation is most marked in the right hand and arm. The left hand and arm are also involved, and to a less extent the legs. The tongue is slightly tremulous. Paresis is present, especially in the right hand and forearm, and is sometimes annoying. The patient occasionally has considerable aching between the scapulae and in the sacral region. There are no other sensory phenomena of moment. The tendon-jerks of the upper and lower extremities are normal, or possibly slightly exaggerated. The intellectual faculties are unimpaired in any particular. The memory, always good, is as reliable as ever. The general condition is fairly comfortable. He has no important complaint, save weakness, i. e., a physical incapacity to engage in his usual pursuit—farming. The patient had always been a strong, healthy person, until he had a severe attack of "grip." This left no marked defects, but possibly some general debility. A year later he was taken ill with typhoid fever, and was confined to his bed four weeks. Two weeks after getting up he was able to go about his farm. Soon thereafter he undertook work which, he noticed at the time, was a little too much for his strength. He was annoyed by a tremor, or shaking, which began during the fever and followed exertion of any kind. Within the next few weeks he remarked that the right arm was distinctly more tremulous than other parts, and that this member was especially weak. He was conscious of considerable tremor towards the end of the fever. This, from his description, was the familiar asthenic tremor which frequently follows typhoid, and it seems to have been merged into a paralysis agitans in a peculiar manner. The right arm became more and more inefficient on account of the increasing tremor and weakness. After some months it was apparent that the left arm and hand were beginning to be affected in the same manner as the right. Within the past few months the legs have become involved.

McLennan reports the employment of picric acid for acute eczema. A solution of one part of picric acid to eighty-six parts of water is washed over the affected region. The itching soon disappears and a protecting layer is formed, beneath which healing rapidly progresses. In about twelve days the scab falls off, when the skin appears dry and with very little redness. He affirms that the acid is not toxic, and that it may be employed without danger upon very extensive regions deprived of the epithelial layer.—*Med. Press.*

Grawitz, Gerhardt, Hennig, and other authors state that the active principle of the thyroid, a trituration of which with sugar of milk was introduced under the name of iodothyryn by Baumann, enables the physician to avail himself of all the benefits of the thyroid treatment in obesity without the drawback of other thyroid products. Experiments made with iodothyryn have demonstrated that even in cases where no change was made in the diet there was a rapid and marked reduction in weight. This was unaccompanied by unpleasant or toxic effects of any kind, so that the new remedy may be considered as a safe and reliable anti-fat, and an important acquisition to the treatment of obesity.—*Health.*

The Rational Employment of Defectives in Great Britain.—The *Popular Science Monthly* says: It seems that there are in England and Wales 20,000 children so defective in mental powers that they are incapable, if left to their own resources, of fighting the battle of life. It is now proposed to take steps to provide a home for feeble-minded girls in West London. Dr. Warner, who takes great interest in the subject, says that since 1890 six homes have been started and kept going, the girl inmates helping to support themselves by laundry work and other occupations suited to their capacities. It is hoped eventually to have such institutions in all parts of England and Wales.

The *Phrenologic Journal* gives the following hints on the applications of water in severe attacks of illness. The adult members of a family should keep them in mind for an emergency:

A strip of flannel or a soft napkin, folded lengthwise and dipped in hot water and wrung out, and then applied around the neck of a child that has the croup, will usually bring relief in a few minutes.

A proper towel folded several times, and dipped in hot water, quickly wrung and applied over the site of toothache or neuralgia, will generally afford prompt relief.

This treatment for colic has been found to work like magic.

Nothing so promptly cuts short a congestion of the lungs, sore throat or rheumatism, as hot water when applied early in the case and thoroughly.

Hot water taken freely half an hour before bedtime is an excellent cathartic in the case of constipation, while it has a soothing effect upon the stomach and bowels.

This treatment continued a few months, with the addition of a cup of hot water slowly sipped half an hour before each meal, with proper attention to diet, will cure most cases of dyspepsia.

Ordinary headaches almost always yield to the simultaneous application of hot water to the feet and back of the neck.—*Scientific American.*

T. Morisani has investigated (*Archivio di Ostetricia*) the action of the bacterium *coli commune* on the lining membrane of the uterus. He first experimented with cultures of the microbe on the uninjured uterine mucous membrane, and after from four to twenty days got negative results. Then he experimented on an irritated endometrium. The irritation was either mechanical (a probe), thermal (hot water), or chemical (silver nitrate); and the result in every case was death after from fourteen to fifty-two hours from endometritis and septic peritonitis. It is therefore evident that the cultures of this bacterium do no damage to an unbroken endometrium; whether this result is due to the uterine secretion which prevents the growth of the micro-organisms, or to phagocytic action is left uncertain. When, however, the mucosa is irritated, a local and general form of infection is set up. Morisani believes the changes to be due to the bacterium and not to the irritation, for in a test case he applied nitrate of silver to the endometrium without the presence of the bacterial culture, and the result was temporary destruction of the tissues without any trace of endometritis, or suppuration. In another group of cases the cultures were introduced into the rectum, and in some of these the uterine mucosa was irritated, in others it was not. All the animals died, but only in those with a damaged mucosa were there signs of endometritis.

Professor Juan L. Hohr, of Cadiz (*Anales Médicos Gaditanos*) reports four cases treated with Koch's new tuberculin. (1) Boy, aged seven years, suffering from Pott's disease and tuberculous osteitis of the femur. There was a fistula with scanty discharge, with pain in the limb so severe as to prevent sleep, and great weakness. On April 21 1 c.cm., of the 1-500 solution, and on the 23d 2 c.cm., were injected. The immediate result was increase of suppuration and cessation of the pain. Further injections were followed by rise of temperature, sleeplessness, and loss of appetite, and they were discontinued for two or three weeks. The treatment was then resumed, but the febrile symptoms produced were so marked and showed such persistence that it was again abandoned. The sole benefit observed in this case was the total cessation of pain. (2) A man, aged 23, with pulmonary tuberculosis at both apices. Injections of the 1-500 solution caused increase of cough and diminution of appetite; the febrile reaction caused by the tuberculin continued for some days after the injection. (3) A man, aged 31, with tuberculous adenitis of the cervical glands and ulcers on the neck and shoulders; no chest symptoms. Injections of 1 and 2 c.cm. of the 1-500 solution were followed by the development of sharp catarrh with abundant discharge and cough. The effect of the tuberculin on the diseased parts in the neck was to set up inflamma-

tion in the scars of old ulcers, which quickly broke down, exposing caseous material which was eliminated in a few days. But new points of ulceration appeared in the neck, and at the same time chest symptoms developed to such an extent that it appeared that the disease had been kindled in several foci. On the injections being discontinued the patient regained his strength, and the ulcers healed under surgical treatment. (4) A woman, aged 36, suffering from superficial lupus of the nose and upper lip, which were the seat of scars; the disease was of eight years' standing. There was a fresh patch on the chin and another along the jaw. Injections (1 and 2 c.cm.) of the 1-500 solution caused disappearance of the redness around the patches, but the patient complained of great weakness and pain in the limbs and of feeling "ill all over." The treatment was therefore discontinued. The author's experience leads him to conclude that the new tuberculin, even in the highest degree of dilution, always causes reaction, though the intensity may vary. Koch's statements cannot, he thinks, be reconciled with clinical facts, and he considers the new tuberculin "impossible" as a therapeutic agent.—*Brit. Med. Jour.*

Dr. F. Epstein, in the June number of the *Zeitschrift für Hygiene und Infektionskrankheiten*, reports the results of experiments made by him with the direct object of ascertaining the disinfecting properties of alcohol on bacteria. He concludes that absolute alcohol has no disinfecting power whatever, but that dilute alcohol does act as a disinfectant. He found in all his experiments with the purely spirituous liquors that alcohol of fifty per cent. acts the best. If weaker or stronger, its disinfecting power is impaired.—*Mod. Med.*

Dr. M. F. Weyman (*Med. Herald*) gives the following practical points in regard to fish bones in the pharynx.

1. Fish-bones which become fixed in the pharynx almost invariably insert themselves in the lateral walls of the pharynx, a little below the aryepiglottic fold.
2. They are usually thin, sharp bones with sharp ends.
3. They are usually deeply driven into the tissues.
4. Inspection by means of the laryngoscopic mirror is not, as a rule, successful.
5. They should be located by digital examination, the throat having been rendered insensible by cocaine.
6. The easiest way of extraction is by means of a Toynbee polypus forceps, the point of which should be guided along the index of the exploring hand, the tip of that index to be in touch with the foreign body.

Arsenite of sodium is said to be the best form in which to administer the drug hypodermatically, not producing toxic effects so quickly as when arsenic is given by the mouth.—*Med. Rec.*

W. C. C. Pakes (*Jour. of Path. and Bact.*) gives an interesting account of his experiments with formalin upon cultures of bacteria. In the first experiment a glass cylinder was used, the bottom being covered with a layer of absorbent cotton-wool saturated with formalin. In this were placed cultures of bacteria, those without spores and those with spores. In the cultures without spores all growth ceased in thirty-six hours, while in those containing spores growth continued up to ninety-six hours, showing that four days is sufficient in the formalin chamber to kill cultures, whether there are spores or not. In a second series of experiments he shows that formalin does not alter the reaction of bacteria to staining reagents, nor does it decolorize in the least. From this he concludes that it is possible to give to a class of students killed cultures of pathogenic bacteria which retain all their special and characteristic staining reactions.—*Mod. Med.*

The *Berl. Klin. Woch.* gives an account of **Salzwedel's Spirit Treatment** prepared by Loew. The dressing consists of a layer or layers of gauze saturated with spirit, then a layer of dry aseptic wadding, the whole covered by a layer of perforated waterproof material. The dressings, which extend far beyond the affected area, are changed every 24 hours, when unless more spirit has been afterwards added they are found to be quite dry. The inflammatory process loses its tendency to spread farther; redness, swelling, and pain cease, and unless an abortive disappearance takes place, a circumscribed abscess forms. In 23 phlegmons the inflammation spread no farther. Even in the case of infected wounds the redness and swelling disappeared within 24 to 48 hours. Mastitis was not much influenced by the treatment, but it appeared specially serviceable in erysipelas. Some pain was occasionally complained of from the application.

A young girl, with a view to improving her complexion, adopted the remarkable habit of eating wax candles. According to the medical evidence at the inquest, however, the effect was to cause her to become very anemic. One day she was found in a comatose condition, and despite medical treatment she died. Death was attributed to "mal-nutrition of the vital centres of the brain," whatever this may mean. The newspaper report from which we cull this information does not mention whether inquiry had been made into the precise description of the candles which were eaten, and yet the matter is one of no little importance. Possibly the candles were colored ones, in which case the coloring might be due to some poisonous drug. It is true that the symptoms did not seem to point to any irritant poison, such as arsenic, having been taken with the candles, nevertheless it is quite possible that some other toxic substance was thus consumed.—*Med. Press.*

Virchow's Archiv., Nasse, Nordhausen, reports a series of cases of mammary carcinoma cured by a varying number of injections of diluted alcohol. He considers that by such injections a kind of experimental cirrhosis is set up analogous to that produced by alcohol in the liver. The cases were twenty in number, and taken in conjunction with a certain amount of success obtained by other observers, by similar means, they are to that extent worthy of note.

I see that Prof. Lusk advocates a milk diet for pregnant women, and am just here reminded that the milk diet becomes a veritable hobby with many people, which may be excusable in the great centres of population where milk is a luxury, but half the women in this great State of Ohio would rather take the risks of a siege of eclampsia than to be tortured for three months upon a milk diet. But our study of the etiology indicates the necessity of a diet restricted in quantity generally, in the absence of a knowledge of the specific poison or its composition; and, when the usual prodromal symptoms put in appearance, a diet of any kind should be interdicted until the natural and usual medical means of eliminations have had time to rid the system of its baneful products.—(PHILIPS) *Columbus Medical Journal.*

NEWS AND MISCELLANY.

Statistics compiled by Cornet from the records of the hospitals of Prussia, show that the average expectation of life among the nurses was only 36 years. That the mortality from tuberculosis was 70 per cent; that in two hospitals every death among the nurses for 25 years, had been due to consumption; that the disease developed after the nurses entered the hospital, as they were subject to a rigid physical examination before admission.

Dr. A. G. Young (*Sanitary Inspector*) says: "In every school the pupils should be taught what to do if their clothing should take fire. They should be taught to throw themselves upon the ground—into the grass, into the mud, or into the snow—or upon the floor, and roll over and over. They should be charged against running and thereby fanning the fire into a fierce flame."

Expressed in time units, the distance between Cape May, N. J., and Philadelphia, is 100 Minutes—measured by the "Century Flyer" over the route of the South Jersey Railroad.

This, and like marked reductions in time to other points, in connection with the superior modern equipment, splendid service, and capable management maintained by the railroad, easily accounts for recent great increase of travel to the health resorts along the southern coast of New Jersey.